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ADDRESS AT THE ANNUAL GENERAL MEETING

of the Society held on 19 October 1936, by the President

MAJOR-GENERAL SIR PERCY COX, G.C.M.G., G.C.I.E., K.C.S.I.

IN the period which I am now about to pass in review one portentous event stands out in sharp relief above all others—that grievous stroke of fate which robbed a nation of its beloved sovereign and this Society of its Royal Patron. Fellows of the Society need no reminding, I am sure, of the close and gracious association of the Royal Family with their institution, and they have been made acquainted by announcements in the *Journal* with the action taken by the Council in their behalf to express, on this sad occasion, their deep and loyal sense of loss. But those here who are not members of the Society may appreciate it if I repeat the opening paragraphs of the Annual Report of the President and Council which I shall be presenting to the Society a little later this afternoon:

"From early manhood King George had bestowed upon our Society many marks of His Royal favour. As Duke of York he became Honorary President. As Prince of Wales he became Vice-Patron in 1901, and on His Accession to the Throne in 1910 confirmed the Royal Patronage which our Society had enjoyed from its foundation. During the twenty-five years of His beneficent reign He gave to us especial marks of His Royal favour, and His death was mourned by no more loyal and loving subjects than the Fellows of this Society.

"At a Special Meeting on Thursday, 23 January 1936, the Council resolved upon a humble Address of condolence and congratulation to His Majesty King Edward the Eighth, who commanded the Secretary of State for Home Affairs to convey to the President and Council in reply His grateful Thanks for the assurances of sympathy and devotion expressed in their Loyal and Dutiful Address.

"The King has further commanded the Keeper of the Privy Purse to inform the President that His Majesty has been graciously pleased to grant His Patronage to the Society and to continue the gift of the two Royal Medals annually."

As regards the Society's annual casualty list, I think you are generally aware that it displays curiously little difference from year to year in the proportion

which it bears to the total figure of our membership, and in that respect the last year has been no exceptional one. Unfortunately the present list includes some very distinguished personages: H.M. King Fuad, King of Egypt; our great Field Marshal, Viscount Allenby of Megiddo; Doctor Jean Charcot, the famous French Polar explorer; General A. W. Greely, the American Polar explorer of the '80's; Sir Alfred Sharpe, formerly Commissioner of British Central Africa; and Sir Henry Wellcome, F.R.S., the well-known philanthropist and traveller. I will add a brief reference to the record of each:

King Fuad had been an Honorary Fellow since 1925; His Majesty had shown his keen interest in geography by promoting the International Congress which met in Cairo in 1925, and paid an informal visit to the Society in Dr. Hogarth's time. His son and successor, Prince Faruk, it will be remembered, came to England early in the year accompanied by Sir Ahmed Hassanein Bey, the Egyptian explorer and Gold Medallist of this Society. The latter informed me shortly after his arrival in England with his Charge that he looked forward to bringing the young Prince to our lectures as soon as he was sufficiently expert in the language to be able to enjoy them.

Lord Allenby had been a valued member of our Council for several years, and when in England seldom missed a Council Meeting or a lecture. After the last Council which he attended, that of May 4, only a few days before his sudden passing, he spoke to me on our way out of the building of the great interest which his association with the work of our Society afforded him. An expression of the Council's deep sympathy with her in her sorrow and profound regret at their own loss was conveyed to Lady Allenby, and I represented the Society at the impressive service in Westminster Abbey during which the late Field Marshal was laid to his rest. I am glad to think that Lady Allenby hopes to keep up the close interest which she and the late Field Marshal always took in the activities of the Society.

Dr. Jean Charcot, who came to a tragic end a few weeks ago when the veteran Polar yacht *Pourquoi Pas?* was wrecked and foundered with all hands but one in a gale off the Iceland coast. Dr. Charcot was a Polar explorer of very great distinction. In his earlier years he had been mainly concerned with the Antarctic, whither he led expeditions in 1903 and 1908. Since the Great War however he had devoted his attention to the Arctic. He was close upon seventy years of age, and I believe intended that this last voyage in the *Pourquoi Pas?* should be both his farewell to the Polar regions and that of the old ship. On the news of his tragic death reaching me during the vacation I sent telegrams of condolence on behalf of the Council to the French Geographical Society and to Madame Charcot and his daughters, and Admiral Goodenough kindly responded to my request that he should represent the Society at Dr. Charcot's funeral in Paris. This took place last week, and you will have been interested to see in *The Times* a day or two ago the photograph of a medal which has been struck in his honour. He was awarded our Founder's Medal in 1911 and became an Honorary Member in the same year.

Major-General A. W. Greely died last autumn in his ninety-second year. Doctor Mill contributed a full biographical sketch of his career to the *Journal*, and I will make but brief mention of his achievements here. He first came to prominent notice when appointed to command an Arctic expedition under the

International Polar Research Scheme in 1881–82. The expedition was to have been relieved in 1883, but the relief ship failed to reach the party, and he and his comrades were practically *in extremis* when they were rescued in June 1884. I had just reached man's estate then and had begun to take notice, and Greely's name and his narrow escape have always remained vivid in my memory. He visited this country in 1885 and was awarded the Founder's Medal and made an Honorary Member of the Society in the following session.

Sir Alfred Sharpe had also reached a ripe old age, being eighty-three when he died at the end of last year. He had played a leading part in the establishment of British rule in Nyasaland in association with Consul O'Neill, Lugard, and Harry Johnston. In 1897 he succeeded the latter as Commissioner of British Central Africa, now the Nyasaland Protectorate, and held it until his retirement in 1910. He received the Cuthbert Peek Award in 1898 and served on the Council of this Society from 1913 to 1917.

Sir Henry Wellcome, F.R.S., who also died full of years last July, was an American by birth. After a boyhood spent among the Indian tribes of Dakota, he obtained a diploma in pharmacy, and in 1880 migrated to London, where, in partnership with S. M. Burroughs, he founded the firm of Burroughs and Wellcome, which has since achieved such a world-wide reputation. His particular interest in life was medical history and research, and during the first thirty years of this century he founded various scientific institutions connected with medicine, including the Tropical Research Laboratory at Khartoum, with the co-operation of the Sudan Government. Then in 1931 he founded the Wellcome Research Institution, designed to co-ordinate the work of the various laboratories in which he was already interested. Sir Henry was always a generous supporter of serious exploration and of missionary enterprise, and had been a Fellow of this Society for nearly half a century. Incidentally I may mention that he was a generous contributor to our funds in connection with the purchase of Lowther Lodge. He was knighted in 1934.

Lack of time demands a still briefer mention here of others among the pilgrims who have been prominent at some period of their career in the geographical sphere, but fuller details of their records are to be found in the obituary columns of our *Journal*.

Colonel P. M. Kozlov was identified with important travels in Mongolia and Eastern Tibet over a period of forty years, and in his earlier travels he was associated with the famous Prjevalsky. He published extensive reports regarding his explorations, and in 1911 was awarded the Founder's Medal of this Society, of which he also became an Honorary Member.

His Excellency Jaime Batalha-Reis, a Portuguese nobleman, was not an explorer but an historical geographer of repute. He was closely associated from the time of its inception with the work of the League of Nations.

Mrs. French Sheldon, who died at the ripe age of eighty-nine, was one of the twenty-one ladies elected to the Fellowship of this Society in 1892, when the decision to admit ladies was put into operation. She was well known at the time for a gallant journey which she made alone from Mombasa to Kilimanjaro unaccompanied by any white companion. She subsequently travelled extensively in the Congo, where she established happy relations with the Belgian authorities, who gave her every facility for travel.

Ronald Giblin, a Tasmanian by birth, served for many years in the Royal Survey Department of Siam. On his retirement from that country on pension he settled in England, and occupied himself by writing a valuable history of Tasmania.

J. H. Edgar, a missionary in China for thirty years or more, died in harness at Tatsienlu on the China–Tibet border. He was particularly interested in the mountain ranges of that region, especially in the one which includes the great peak of Minya Gongkar, on the subject of which Professor Arnholf Heim gave us such an interesting and beautifully illustrated lecture in February last.

Miss Annie Smith Peck, an American lady who died last July, aged eighty-four, was an ardent supporter of women's suffrage in her youth and a pioneer of mountaineering for women in America. She had to her credit some of the great peaks of Mexico and the Andes, and made the first ascent of the lower north summit of Mount Huascaran, 21,812 feet, in the Cordillera Blanca of Peru.

Arthur Douglas Carey died in June, aged ninety-two. A member of the Indian Civil Service, he became interested in Central Asia, and took two years' leave in 1885 with a view to exploration in Chinese Turkistan, accompanied by Andrew Dalgleish, who joined him at Leh. They explored a wide expanse of unknown and inhospitable country, and at one period travelled for eighty days without meeting a single human being, while their animals almost succumbed from lack of pasture. Finally they got back to Leh by the Karakoram, having acquired a great deal of valuable information. For this journey and its results Mr. Carey was awarded our Founder's Medal in 1889.

Turning now to the subject of Expeditions in which the Society has been interested, I will touch first on those which have returned to this country and have given us an account of their fortunes in this Hall since I last addressed you in June, 1935, sixteen months ago.

Freya Stark set out from Aden nearly two years ago, intending if possible to reach Shabwa, the old Himyarite capital, from the south, *i.e. via* Makalla. Unfortunately she contracted measles before she had reached the confines of the Hadhramaut, and the malady took her very seriously. Indeed, she was almost *in extremis* when her S.O.S. reached the Aden authorities, and the Air Force sent out a plane to bring her in. This was in March 1935, so that in ordinary circumstances her journey would have fallen within the period covered by my last year's address, but the traveller reached her home in Italy such a complete wreck that it was not until the December following that she was able to come to England and give us an account of her experiences.

Her paper was a very interesting and well-illustrated one; she made no claim to discovery or the opening up of new ground; the value of her narrative lay rather in the intimate account she gave of Arab home life in the Hadhramaut, gathered from the women folk of families who had extended to her their simple hospitality.

Oxford University Expedition to Ellesmere Land. The party returned in October 1935, and we had, as it were, a composite lecture shared by Dr. Noel Humphreys, the leader, Edward Shackleton, and A. W. Moore. The party had had very bad luck in regard to ice conditions to start with, and instead of

getting straight across Smith Sound to Fort Conger as they had hoped, they had been obliged to make their base at Etah for the winter. Nevertheless they succeeded in accomplishing really valuable work, including the discovery of a new range of mountains between the United States range and the Arctic Ocean. They paid great tribute to the Danish and Canadian authorities for the helpful co-operation they had received.

Expedition in the Libyan Desert. Mr. W. B. K. Shaw, who received the Gill Memorial Award in 1934 for previous journeys, proceeded again to the Libyan Desert. His party numbered six, including himself. Among them they had varied interests, archaeology, survey, geology, botany, and natural history, and apart from the sad accident which cost Colonel G. A. Strutt his life, they had a very successful trip, of which Mr. Shaw gave us an interesting account at our evening meeting of January 6.

Augustine Courtauld and Lawrence Wager and party were just leaving for East Greenland when I last addressed you, in the good ship *Quest*, which had been chartered for the summer by the former, on a combined plan of operations. Until the autumn they intended to operate as one expedition, with the object of further exploring the coastal belt between Kangerdlugsuak and Scoresby Sound, and, if possible, of ascending the principal peak of the Watkins Mountains which Martin Lindsay viewed from a distance when crossing the ice-cap from the west. In August, Courtauld was to return with the *Quest*, leaving the Wagers' party to remain through the winter in Rasmussen Land, with a view to completing a full year's study of the geology, botany, and geography of the neighbourhood.

Both tasks were successfully accomplished—Augustine Courtauld returned according to plan in August 1935, and gave us (in March last) an interesting paper on their summer achievements. The principal peak was climbed (for the first time) by members of the party, and, thanks to the sympathetic attitude of the Danish authorities, "The Watkins Mountains" remains the name of the range.

Lawrence Wager and his party, constituting the "British East Greenland Expedition 1935/36," returned "all well" in August, fully satisfied with the results of the year's work which they had been able to put in. During the winter, from their base at Kangerdlugsuak, a valuable programme of geological and botanical work was carried out. Two sledge journeys of 400 miles each were made, in the course of which two routes through the mountain zone to the inland ice were opened up.

A special interest attached to this joint project in that the wives of Augustine Courtauld, the Wager brothers, and Mr. Longland accompanied their husbands. After her husband's paper Mrs. Courtauld charmed us with a brief sketch of their summer experiences. I have seen Mr. Wager only for a few minutes since his recent return, and shall look forward to hearing also, later on, how the three ladies who stayed out the full year stood the winter.

After the departure of the Oxford University New Hebrides Expedition from Espiritu Santo in January 1934, *Mr. T. H. Harrisson* remained to complete his studies of the breeding season of the year and the meteorological observations, which had been the primary object of the expedition. Having done that he transferred his activities to Malekula Island, where he remained until

July 1935, penetrating into unadministered areas, in close contact with the natives. This has resulted in a great extension of our knowledge of a previously little-known people, the Big Nambas of Northern Malekula. Mr. Harrisson read a paper before the Society on March 16 which was of extreme interest. As you have just heard, he has now been awarded the Cuthbert Peek Grant, to encourage him to undertake the further expedition which he is believed to have in mind.

The *Oxford University Arctic Expedition of* 1935/36, led by Mr. A. R. Glen, returned in September. This was the first expedition to have wintered in North East Land. Their base was established at Brandy Bay, approximately in latitude 80° 30′ N. Two stations were maintained on the ice-cap throughout the winter and a number of sledge journeys made, including one round the north coast of North East Land. The mapping of the coast-line was thus completed. Geological, biological, and meteorological observations were carried out and the researches made in regard to wireless problems, especially those concerned with the height and condition of bands reflecting wireless waves up to 600 kilometres above the Earth, were of special importance.

Mount Everest Expedition 1935/36. It will be remembered that when permission was accorded by the Tibetan Government for another attempt on the mountain within the twelve months June 1935 to June 1936 it was not received in time for a properly organized expedition to be despatched during the pre-monsoon season of that year; so it was decided that in order to preclude any danger of the permission lapsing, to send out a Reconnaissance expedition during the summer of 1935 under the leadership of Eric Shipton with the following objects in view:

To remain in the vicinity of the mountain throughout the monsoon and investigate the possibility of a post-monsoon attempt;

To seek alternative routes for attacking the summit;

To report on the present ice-formations on the North Col; and

To try out and acclimatize new aspirants.

Eric Shipton had with him six companions: Messrs. E. G. H. Kempson, Charles Warren, E. H. L. Wigram, H. W. Tilman, L. V. Bryant, and Michael Spender as surveyor, the first three of whom accompanied Mr. Ruttledge this summer. The Reconnaissance party had a wonderful summer, climbing twenty-six peaks in the Everest region of over 20,000 feet; but, as Eric Shipton told us in his paper here of December 2, they found Everest in a most dangerous state after the burst of the monsoon, and themselves only just missed the passage of a huge avalanche. Shipton came to the unhesitating conclusion that the only time of year at which there could be reasonable hope of reaching the summit was during the exceedingly short interval between the end of the winter gales and the arrival of the monsoon.

As you know, this summer there was no such interval. Mr. Ruttledge had with him as fine a climbing party as could possibly be got together, and they were "in the pink," if I may use the term, from the acclimatization point of view, but they were altogether defeated by the weather and snow conditions. The account of their experiences and adventures is again of surpassing interest, but as we look forward to hearing the leader's account of them at our first Evening Meeting on November 2, I will not trespass further on this ground.

Nanda Devi. Though the Society was not directly associated with the project beyond giving it their cordial support with the Powers That Be, I cannot descend from the Himalayas without paying warm tribute to the splendid feat of mountaineering which has resulted, during the past monsoon season, in the successful storming of the Goddess Nanda's beautiful citadel.

The peak of Nanda Devi is 3000 odd feet lower than the summit of Everest —about the same altitude as Camp V on Everest—and the siege of it, both as regards season and mountain idiosyncrasy, has always been recognized by the craft as an entirely different problem to that of Everest, which seems to rest in an evil category all its own. But Nanda Devi is the highest peak not only in British India but in the British Empire, and I know you will join me in according our warmest congratulations to the members of the British-American Expedition on their grand achievement. I doubt not that the penetration of the inner sanctuary by Shipton and Tilman in 1934 will always be regarded by their comrades to have been the first step on the road to victory.

Mr. Kingdon Ward. In April 1935 Mr. Kingdon Ward set out on another expedition, travelling through Assam into the Himalayas east of Bhutan. He covered an immense extent of country, including 500 miles of new ground. In addition to geographical discoveries he made important botanical collections, calculated to illustrate clearly the place of the flora of Tibet in the botanical sphere of South-East Asia. He read us a paper on his journey which both as regards matter and photographs were of the high quality to which he has accustomed us.

British Graham Land Expedition. This important enterprise is still in lively operation. The second year's winter base was established at a group of small islands in Marguerite Bay, a considerable distance south of the first base, and it is hoped that it will prove convenient for sledging parties to the south. During flights made while the base was being moved, new land was sighted to the south, and a subsequent flight revealed that Alexander Land, previously supposed to be an island, appeared to be joined by a mountain range to South Graham Land. A massive group of mountains to the west of Alexander Land, with peaks estimated at 6000 feet, was found to sweep 200 miles to the east, encircling a great bay, and Casey Channel, separating Graham Land from Hearst Land, does not seem to exist. In June a depot-laying party, despite bad weather and adverse ice conditions, succeeded in placing a depot only a few miles short of the proposed site near Cape Pierre Baudin. From this depot it should be possible to explore Stefansson Strait to the south-east. It is clear from recent despatches from the expedition that the small aeroplane which they have with them is being a great asset to the expedition.

Sir Aurel Stein. Since last November Sir Aurel Stein has been engaged upon his fourth archaeological reconnaissance in Persia, his areas of study being the Kuhgalu–Bakhtiari hills, Luristan and Kurdistan.

His proposals for a detail survey from the air of the portion of the eastern frontier of the Roman Empire lying in Transjordan and Iraq, in continuation of the work done by the French in Syria, have received the approval of the Council of the Society and of other learned bodies.

The British Canadian Arctic Expedition under Mr. T. H. Manning left Churchill by whale-boat in June for a three years' stay in the Canadian arctic.

It is proposed by Mr. Manning to survey the west coast of Baffin Land; to determine the present position of the north magnetic pole, last investigated by Amundsen in 1903–6; to make research into the origin of the Eskimo and to study the migrations of the "snow" and "blue" geese by ringing some of the birds. The expedition plans to meet the Canadian Government's supply ship *Nascopie* at Pond's Inlet in the autumn of 1939 for the return voyage.

Mr. Philby's Journeys. When winding up the discussion which followed Freya Stark's lecture last December I remarked that a journey from Mukalla to Taif, skirting the western confines of the great Arabian desert, would be a very fine piece of travel, about the only piece of the Arabian peninsula remaining unexplored. Mr. Philby seems to have taken this as a challenge, for we learn that he has not only made the journey, from north to south, but has also traversed the tract the reverse way, which is another very fine performance to his credit. Details of his route will I hope appear in the November *Journal*, so I will say no more here.

Public Schools Exploring Society. May I in conclusion of my comment on expeditions pay tribute to Commander Murray Levick, the Director of the Public Schools Exploration Society, of which he is making an increasingly successful and valuable enterprise, in the production and training of likely devotees of exploration. I look forward to hearing in the near future the account of their activities during the past holiday season.

As regards lectures in general, including those to which I have referred when speaking of expeditions, I hope you feel that we have had a reasonable variety of them, both as regards region and subject. It is not possible to draw very definite lines of distinction between one category and another, but we seem to have had a fair assortment—SNOW, DESERT, and FOREST. Thus among the sixteen evening lectures that we have had perhaps four might be classed as Polar, two Himalayan, three Central Asian, three Arabian-cum-Ethiopian, two Pacific, and two Alaskan, while the technical afternoon papers dealt with problems of geography in its various branches, *e.g.* human geography, physiography, seismography, hydrography, photography, regional geography, oceanography, and glaciation. I do not know quite under what "ographies" the last should fall, but at any rate there has been a varied mixture of topics.

Three foreign scientists were good enough to come over here to read interesting papers to us: firstly two American scientists, Messrs. Bradford Washburn, Instructor in Geographical Exploration at Harvard, and his geologist companion, Mr. Richard Goldthwait, who gave us an account of the Harvard–Dartmouth Alaskan expeditions in 1933–34, accompanied by beautiful slides; and Professor Arnold Haim, for many years Professor of Geology at Canton University, who read us a valuable paper on the glaciation of Mount Minya Gongkar in Chinese Tibet.

It was a great pleasure to welcome them, and their lectures were much appreciated.

Looking back over our record for the past eighteen months, I have been

interested, and indeed very glad, to note that salient events and developments during the period seem to belong very much to the sphere of survey.

First I would mention the appointment during the past year, by the Ministry of Agriculture and Fisheries, of a Departmental Committee, under the chairmanship of Sir John Davidson, Chancellor of the Duchy of Lancaster (our honoured guest at dinner to-night), to consider the future policy of the Ordnance Survey.

After the war, owing to the stern necessity for economies in all directions, the Ordnance Survey budget was much reduced, while intense building activity and industrial development very rapidly altered the face of the country and urgently demanded revised maps. The normal arrangements for keeping our maps up to date and their periodical revision had fallen sadly into arrears, and a Committee was appointed to consider what should be done. We had had a very interesting discussion on the subject at an Afternoon Meeting, and the Chairman of the Departmental Committee was so good as to invite the Society to submit a Memorandum of Evidence upon certain of the points of reference. This we did, and our representatives were afterwards called to a meeting of the Committee to be examined. We await with great interest the publication of the Committee's final report.

In our evidence to the Committee we laid stress upon the importance of research in the methods and instruments of survey. Up to the present the Ordnance Survey has had no Research Department working in collaboration with that storehouse of knowledge and experience—the National Physical Laboratory at Teddington. We have in several conspicuous inventions made by the Admiralty Research Department an excellent example of the benefit which arises from such collaboration. I would in particular make a few observations on the subject of photographic and photogrammetric surveying (of which Mr. Spender is such a skilled exponent) and on the necessity that we should do something, as the proposed Research Department might do, in adapting the knowledge and practice which exists on the continent of Europe for our own particular needs. On that point may I quote the last two sentences of his invaluable lecture, now in print in the October *Journal*, where he says : "No doubt the Royal Geographical Society will see to it that a Mount Everest Survey is plotted; but one hesitates to advise other expeditions to use photographic survey as long as there is a risk that there may be no opportunity of getting results worked out" (worked out in the British Isles, that is).

How long is this extremely unsatisfactory state of things going to be allowed to last? The rather difficult question whether air survey is in fact suitable for the revision of Ordnance Survey maps is in active discussion. There is the question how far it can be applied, especially in the form of oblique reconnaissance survey to the needs of our Overseas Dominions and Crown Colonies. These would make a large field for the investigations of such a Research Department as I have envisaged. Periodical meetings of the Empire Survey Conference provide opportunities of exchanging new ideas and improved technique. The problem of how to deal rapidly and economically with the urgent necessities of all reconnaissance survey in many of our possessions is urgent, and we cannot be satisfied that any British possession should be without at least a small-scale topographical map. As an example of present

incompleteness I may mention the case of Mr. Gandar Dower, an English sportsman, who, while on a recent quest for a specimen of a new species of lion which is believed to exist in the neighbourhood, has recently discovered a new lake on Mount Kenya.

If I may now refer to one of our own activities in the sphere of survey, I recall the recent issue of the first volume (that is the "Survey" volume) of our 'Hints to Travellers,' which is thoroughly up to date, and has been well received; and secondly the Society's map of the Karakoram of which a preliminary edition has just been printed. I don't pretend to be an expert in map production, but this specimen seems to me to be as beautiful and efficient a piece of draughtsmanship as it would be possible to find anywhere. Surely our draughtsmen who have been responsible for it are greatly to be congratulated. It was prepared to serve as the essential foundation on which to base a discussion on Karakoram range and peak names. Some years ago this problem was the subject of much controversy in our Society, when it was found that there could be no hope of reaching an agreement until there was an adequate map of this very special and important area: a map designed especially for the representation of high relief and glaciation. We now look forward to a small conference which has been arranged for this winter between representatives of the Survey of India and our Society, at which we hope to reach agreement on the trend and nomenclature of the ranges and peaks which make up the Karakoram. It is of real importance to find a solution which shall be generally accepted, and with the sincere wish for the success of the Conference, may I conclude my address and thank you for allowing me to tax your patience so long.

THE MOUNT EVEREST EXPEDITION OF 1936: *A paper read at the Afternoon and Evening Meetings of the Society on 2 November 1936, by*

HUGH RUTTLEDGE

ON the last occasion on which I had the honour to address the Royal Geographical Society my task was to describe the fourth expedition to Mount Everest. That expedition reached a point within about 1000 feet of the summit, and we felt fairly sure that only the extreme and possibly unprecedented rigours of that particular season prevented a complete success. We thought, and with good reason, that Everest had shown herself at her very worst, and that it was unlikely that weather alone would stop a future expedition. We were wrong; the mountain had more shots in her locker, and in laying before my audience the results of this year's expedition I have the invidious task of describing how a party of exceptional competence met with weather not experienced by any previous expedition and was unable to reach a height greater than that attained by the reconnaissance of 1921.

The Tibetan Government's permission to try again was unexpected so soon after the attempt of 1933, but it did not find the Mount Everest Committee unprepared. Unhappily it arrived too late in the season to permit of a full-dress expedition in 1935, but there was time in that year for work which many of us considered a necessary preliminary to a really well-organized assault. That explains the reconnaissance which was led by Shipton last year, of which I will recapitulate the objects:

1. To collect data about monsoon snow conditions at high altitudes and investigate the possibility of a monsoon or post-monsoon attempt.

2. To examine the possibility of alternative routes from the west. Two had been suggested: the north-west ridge which rises from the head of the Central Rongbuk glacier; and the practically unknown Western Cwm, which is really a tributary of the valley which contains the Khumbu Glacier.

3. To report on the present ice formations on the North Col.

4. To try out new men as possible candidates for the main expedition and to secure for them preliminary acclimatization.

5. To try out new designs of tents and other equipment; and also new ideas for provisioning high-altitude expeditions.

6. To carry out a stereo-photogrammetric examination of the northern aspect and valleys of Mount Everest, and to continue the work of the Reconnaissance Expedition of 1921.

Those of you who were present here when Shipton read his paper on December 2, or who have studied that paper in last February's number of the *Geographical Journal*, are well aware with what skill that reconnaissance was conducted, and how much additional knowledge it contributed. From the point of view of climbing the mountain the principal results obtained were an enhanced knowledge of monsoon snow conditions; the trial under high altitude conditions of five new candidates, of whom three were found to acclimatize well; an improvement in equipment; and an excellent survey of the north face by Mr. Spender, with fixation of its salient features.

It was made clear to the Tibetan Government that this reconnaissance was part of the main expedition which would start in 1936, and this enabled us to double the amount of work which would otherwise have been possible. Few climbers can spare the time to visit the Himalaya in two consecutive years; yet it was desirable to test as many candidates as possible among the mountains, for experience has shown that a man's climbing record is not a complete guide to his abilities on an expedition, so Smythe spent part of the summer in the Alps trying out new men. The result was that by the end of October we had a considerable amount of practical data on which to base our selections, and a party was eventually assembled which for general ability, experience, and homogeneity could hardly be bettered. The Mount Everest Committee gave the leader very full discretion, and for his part he lost no opportunity of consulting Smythe and Shipton in the first place, and other members of the party as it came into being. The size of the party was brought down from sixteen in 1933 to twelve this year; of these, nine had been to Mount Everest before, and one (Oliver) had climbed Trisul. Of the remaining two, Humphreys, our senior medical officer, had much experience of expeditions; Gavin was the only member without experience outside Switzerland, but his performance with Smythe during the summer and the extraordinarily good report given him by the medical board of the Royal Air Force secured him a place; of which I may add that he showed himself entirely worthy.

Each successive expedition is able to add something in the way of improved technical detail to its equipment and its food supply. Here I need but mention a new kind of arctic tent which was intended to mitigate the extreme rigours of life at Camp V, and the provision of pressure cookers. Special mention should however be made of oxygen apparatus; Sir Leonard Hill has continued to press with force and ability his view that little if any real acclimatization can be attained above 21,000 feet; and that, although we know that exceptional men can reach a height of 28,000 feet without artificial oxygen supply, conditions above that may bring about a sudden and most dangerous alteration in a party's climbing power. Having heard Sir Leonard Hill's opinion, we consulted the experts at the Royal Air Force establishment at Farnborough, and they most kindly cooperated in various tests conducted in the pressure chamber there. Their experience, though not entirely relevant to our case, seeing that the pilots on whom their tests are usually made are quite unacclimatized, indicated that changes in a man's condition due to failure of oxygen supply may be very sudden. The upshot was that, with the most generous and practical assistance of Sir Robert Davis, a new form of oxygen apparatus was taken out, of which Warren has made a special study. Many experiments were made with this apparatus during the expedition, but we never had the opportunity to test it at very high altitudes. So far as it went, it gave encouraging results, though some of our best men still think that the mountain can be climbed without it and that the risks of carrying so much weight on difficult ground or of a sudden breakdown of the apparatus more than counterbalance its value.

This year the expedition was brought out in echelon, as it were, to obviate waste of time and money. Morris was out first, and his perfect knowledge of Nepali and understanding of hillmen enabled him to collect the finest body

Kongra La

Kampa Dzong

of porters that could possibly be desired. Sixty-five of these men were to accompany us throughout the march; but two recruiters were also sent into Nepal to arrange for more than one hundred additional men to join us at Rongbuk on our arrival there. No praise can be too high for the conduct and ability of these men. Several of them, especially those brought direct from Nepal, were as wild as hawks, and I well remember Morris' cry of delight during an inspection in Tibet when his knowledge of ethnology convinced him that he had discovered a living Neanderthal man. They knew nothing of ice slopes or of snowcraft, but they had the natural strength, ability, and spirit of the true hillman, and with a stiffening of porters who had been to Everest before they refused to be intimidated by any conditions or any difficulties. This time we promoted old and tried hands to the position of sardar or under-sardar with the most happy results. Given responsibility, these men saw to it that the recruits were kept in order, revelling in a discipline which in their younger days they had themselves often ignored; and they were given charge of specific portions of equipment and stores, with such success that at the end of our long march to the Base Camp only two or three tins of soup were missing, and those had probably fallen out of a disintegrating box.

Allotment of work was made at a very early stage: Smythe and Wigram managed the Mess; Morris and Oliver the transport; Shipton the porters; Kempson the postal arrangements; Humphreys and Warren, besides their medical duties, dealt with physiology, the oxygen, botany, etc.; and Smijth-Windham found a most able understudy for the wireless in Gavin. Wyn Harris, undeterred by the miseries of account keeping in Tibet in 1933, resumed this thankless task. I must not forget to mention our lively and extremely capable interpreter, Karma Paul, who has been with every expedition except the first; nor Jemadar Lachhman Singh Sahi of the 1/3rd Q.A.O. Gurkha Rifles, who was with us in 1933, and Lance Naik Lilambar Rana and Lance Naik Gopal Gurung of the 2/3rd Q.A.O. Gurkha Rifles, specially selected by Morris for work with the transport and arrangements of camps. Jemadar Lachhman Singh gave Wyn Harris invaluable help in bookkeeping, and the other two were always willing to do whatever was asked of them. All stores were assembled at Kalimpong, where we received that practical help and most kind hospitality which make us consider Mr. and Mrs. Odling as valuable members of Mount Everest Expeditions. The real march was begun on March 19 from Gangtok, where we experienced similar hospitality and goodwill from His Highness the Maharaja of Sikkim and from Mr. B. J. Gould, Political Officer in Sikkim.

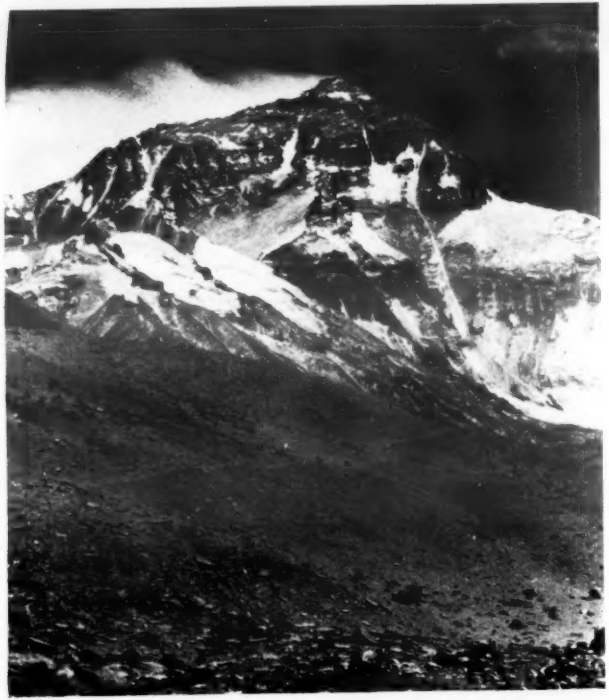
Before leaving, a complete and detailed plan of assault had been worked out at a staff meeting attended by Smythe, Shipton, Wyn Harris, and Kempson. These staff meetings were a great help; they enabled the leader to collate the views of the most experienced men and, while not forgetting his own responsibility to make definite decisions, to obtain the greatest measure of general consent. Mountaineering parties do not, or should not, require the methods of dictatorship. It had been decided, after considerable inquiry, to risk crossing the two high passes in the north of Sikkim direct to Kampa Dzong in Tibet. We knew that these two passes, the Sebu La and Kongra La, were not in any way difficult or dangerous. The Maharaja of Sikkim saw to it that

tracks and bridges were repaired, and that adequate transport was forthcoming; the rest was easy. So we left the beautiful green valley of the Teesta river for the narrow gorges, the stony mule tracks of upper Sikkim, and ultimately the rolling downs of the Tibetan plateau.

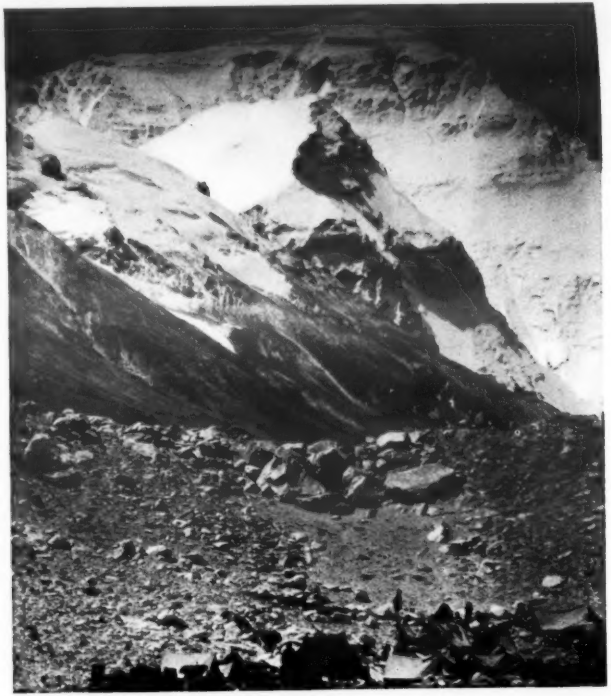
A deliberate halt of some days was made at Thangu, the last rest-house in Sikkim. Here, at a height of about 13,000 feet, it was thought that we might acquire some preliminary acclimatization and find our mountain legs. A height limit of 18,000 feet was imposed, lest enthusiasm should outrun discretion and bring on staleness. Incidentally, this halt gave Morris the opportunity to recover at least partially from a severe attack of malaria which had overwhelmed him at Lachen and very nearly brought about his summary return to India. The passes were crossed on April 2 with a refreshing absence of distress, a contrast to the misery experienced there last year. By this route we had saved ourselves from the appalling spring conditions on the Phari plain and saved at least five marches. Marching across the plateau this time was almost unalloyed pleasure; the weather was comparatively warm, and our welcome was not even comparatively so, for we found old friends among the Tibetan officials who seemed positively pleased to see us again.

At Kampa Dzong there was a display of horsemanship and shooting; the riders were arrayed in medieval costume, and their object was to gallop past a small target fixed on a stick and to hit it either with gun shot or with a stone. The latter appeared to be the more dangerous weapon of the two; indeed, I have never seen the equal of Tibetans at stone throwing. At Tenkye Dzong the people probably remembered our Olympic games of 1933. They turned up in considerable force to watch and participate in when possible our games of football with the men. At Shekar Dzong we were most cordially greeted by the same Dzongpen as before. He even lunched with us, finding about as much difficulty with our knives and forks as we had had with his chop-sticks, and commenting favourably upon the cleanliness of our service. Fortunately he did not inspect Chun-Chun's arrangements for washing dishes round the corner.

Although we were experiencing splendid weather on this march, we had on several occasions observed disturbed conditions over the Everest region, and I do not think that an earlier arrival at the base camp would have been profitable. However on April 26, when we reached Rongbuk, the mountain looked absolutely magnificent, and in the best condition for climbing except that a strongish wind, estimated at between 40 and 50 m.p.h., was blowing a great plume of snow and ice away to the south-east. The old Lama of Rongbuk, though he shows unmistakable signs of advancing age, gave us a splendid reception. This time we felt that he was really pleased to see us; he gave us tea, blessed both us and the porters, told us to be very careful, and was convinced that we were going to have fine weather. This latter opinion, I may add here, had been offered in a more cautious way by the meteorologist at Alipore when I visited him in February. He then said that there were no indications that we were to have an abnormally early monsoon; western disturbances from the Persian side might give very bad weather in the Everest region at intervals, but for short periods only; the monsoon, when it did come, should take between a fortnight and three weeks to pass up from Ceylon to Mount



Mount Everest in good condition



Mount Everest in bad condition

Camp II

Everest; on the other hand, what he called the equatorial current in the Bay of Bengal seemed to be rather strong and might increase the rain-bearing capacity of western disturbances, but it should split up in the neighbourhood of Orissa, one part going towards the United Provinces on the west and the other towards Assam on the east. On the whole it seemed likely that we should get better weather than in 1933, and there was quite a chance that there would be an interval of comparative quiet between the first arrival of the monsoon and its full establishment.

All this was very encouraging, and no time was lost in getting to work to establish the camps on the East Rongbuk glacier. Everybody was well; there were none of the sore throats which had been so troublesome on the last occasion. The old Base Camp was complete by April 27. We had decided to make Camp I our real base this year, but to retain the old names of camps, to avoid confusion. Smijth-Windham decided to have his wireless base at Camp I also, so for the next four days very heavy work was demanded of the entire porter corps, several of whom made double journeys with extra heavy loads. But not a man broke down or grumbled.

Smijth-Windham got into wireless communication with Darjeeling from Camp I on April 30, and was immediately informed that a disturbance might be expected. The same evening snow fell. This did not worry us, as disturbances are always to be expected at this time of year. Little did we think, as the mountain turned from black to white, that never again should we see her as she must be if success is to be attained. It was observed at the time that the snowfall was not accompanied by a heavy north-west wind and we carried on with the work, experiencing very little discomfort. Camp II was made at a place observed by last year's reconnaissance, in the central trough of the glacier, a far better place than that used before, and on the direct line to Camp III. I remember that on our first night there the approach of high-altitude conditions was shown by our failure to see much humour in the short-comings of our cooks. But this was a minor matter, and on May 7 and 8, that is to say within twelve days of our arrival at the Base Camp, Camp III was in full occupation as our advance base.

Our original plan, worked out in detail at Gangtok, had been to make Camp IV on the North Col on May 22 and to commence the assault up the north ridge on the 25th. The condition of the party however was so good that it was decided to try and have Camp IV completely organized by May 15, and to commence the assault on the 18th. The first part of this plan was successfully carried out; Smythe, Shipton, and Warren made a preliminary reconnaissance of the North Col slopes on the 9th. They found that the ice formations had changed considerably since 1933 and that it was no longer possible to attempt the direct route of that year, principally because the ice-wall appeared to have doubled in height. Accordingly they began work away to the right and cut steps up the first 500 feet direct. From that point it would be necessary to make a long traverse—a thing no one likes doing on slopes of this character—and then force a way direct up to the crest. On May 13 Smythe, Oliver, Wigram, and Gavin with ten first-rate porters made the whole route up to the crest, fixing ropes over a great portion of the route. This was a desperately hard day's work, but it was so well done that next day

Wyn Harris and Kempson had no difficulty in escorting forty-six porters, half of whom had never been on an ice slope beforh, and established Camp IV on the crest. The old ledge of 1933, some 240 feet down, had now disappeared.

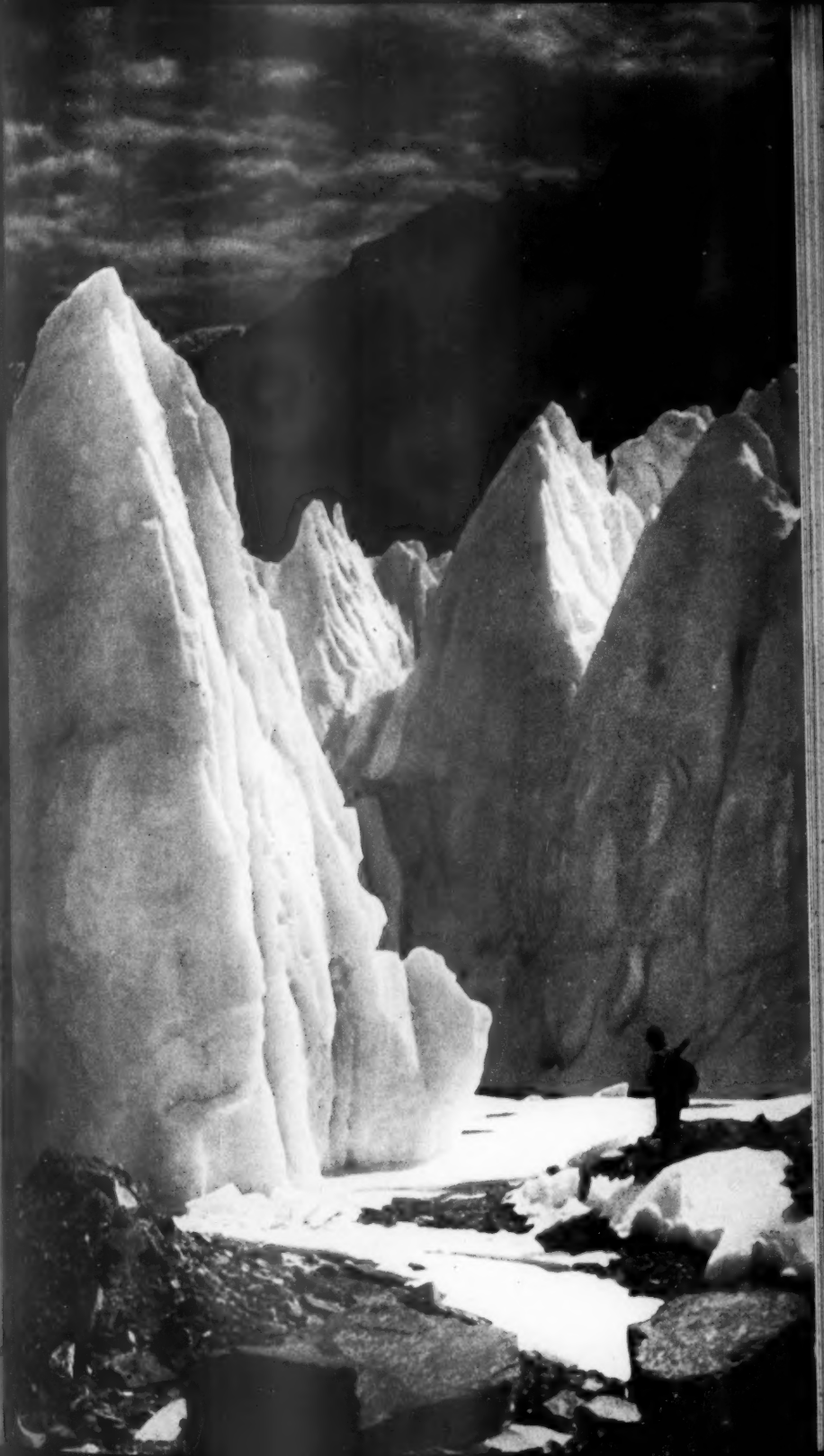
They returned to Camp III, which by the way was placed this year 500 feet higher and much nearer the foot of the North Col than before, the same evening. Next morning, May 15, Smythe and Shipton occupied the North Col with fifty-six men, of whom forty-two remained to establish the higher camps. It should be observed that all this had been done without anything like the exposure, danger, and distress which the work entailed in 1933. There was practically no wind and everybody was in splendid form. That was the end of our good fortune. There was not a great deal of snow on the mountain at this time, but what there was showed no tendency to disappear and was being steadily added to evening by evening. We positively longed for the north-west wind which alone could remove the snow. Day after day was unhealthily warm, with slight breezes from the east. Smijth-Windham's high-altitude light wireless sets were working splendidly, so that I was in constant touch with Smythe. The wireless telephone exchange at Camp III had been set up and was being worked with great skill by Gavin.

Morning and evening Smythe said that conditions were getting worse and that he did not advise any attempt to establish Camp V yet; and on the 18th he gave his opinion, supported by Shipton, that it would be useless to hold the camp any longer for the present. There were about 2 feet of snow on the North Col itself, and any amount higher up; and some of the porters were showing signs of strain. In any case we knew that a prolonged stay on the North Col would be of benefit to nobody. Smythe brought his party down the same evening; watching them from below, we could see that every mountaineering precaution was being taken lest an avalanche should occur, especially on the dangerous slopes of the traverse. It was a great relief to have the whole party down safe.

The climbers had now been at or above Camp III for eleven days, and it was obvious that the mountain would not be climbable for some time, even should the north-west wind get up. It was accordingly decided to exchange the comparative discomfort as well as the altitude of Camp III for the milder conditions of Camp I. I had already begun to notice that when a party cannot be kept fully occupied at these altitudes the strain of merely living there seems to take more out of them than if they have definite and continuous work to do. An immediate improvement in health was at once observed at Camp I. During our stay higher up Morris had had to be brought down from Camp II, where he was desperately ill with a renewal of his malaria; and Humphreys at this time was a good deal worried by a sore throat. However, Camp I was a very cheery place indeed until next morning, May 20, when Alipore reported by wireless that conditions favourable for the formation of the monsoon in the south of the Bay of Bengal had been observed.

Up to this moment we had not had the slightest reason to suppose that the monsoon would be even heard of before the end of the month; so this news was a most disagreeable shock. The staff met at once, and although we had only come down from Camp III the day before, we decided that we must

The trough of the East Rongbuk Gl



return immediately and place ourselves in position to make at least one attack before the monsoon arrived, even if this meant tackling the North Col and the slopes beyond while there was more snow on them than we liked. It was just possible that what is called the Chhoti Barsat, or first portion of the monsoon, might exhaust itself upon the Darjeeling foothills and never reach us, and that there might then be a quiet interval during which we could continue the assaults without interruption. The party was ready for anything, and by the 24th we were again in full occupation of Camp III. The prospect there was anything but reassuring; indeed, dismal prospect speedily immerged into grim certainty. Incredible as it may seem, the monsoon rushed up from Ceylon to the Everest region in four days instead of the usual fortnight or three weeks, and hit us hard on the evening of the 24th. I am assured on good authority that this phenomenon has never been observed before. The only explanation can be the total failure of the normal north-west wind to stem the current.

Camp III was anything but a pleasant place of residence during these days; and the North Col was obviously unapproachable. I find from my diary that, for lack of anything better to do, I made the tentative suggestion that we might go round and have a look at the west side, which Mallory had rejected in 1921. Those members of last year's reconnaissance who had seen it did not think that anything could be done there, so the proposal was dropped for the moment; and on receipt of a definite warning from Alipore that a severe storm was on the way a second retirement to Camp I was ordered, and accomplished on the 28th through a quite sufficiently unpleasant blizzard. But the mountain had not yet finished amusing herself at our expense; next morning we awoke to find for the first time a really strong north-west wind blowing. This was the most welcome of all possible changes, and we lost no time in going down on to the Main Rongbuk glacier, from which the mountain could be seen. Snow was being blown in enormous sheets off the great north face in a way which promised a complete clearance in two or three days. We hurried back to lunch and were met by a delighted Smijth-Windham, who produced a wireless message to the effect that the monsoon showed signs of weakening and had been driven off towards Assam. Whatever the wind, we could not neglect this opportunity, and the party rose as one man for the third ascent to Camp III.

But it was not to be so easy as that. At the very moment of our starting the north-west wind appeared to hesitate, and by the time we had reached Camp II very heavy snow was falling, and Mount Everest was completely weatherbound until the morning of June 3, when we had to make the best of the fact that the north-west wind resumed its activities simultaneously with the arrival of a weather report that we might now expect the monsoon from the Arabian Sea as well as from the Bay of Bengal. Camp III was just a wilderness of snow, and the North Col looked like a stage set for the Ride of the Valkyrie, with snow instead of smoke flying up in great columns into the sky. However at least this snow was being blown about and not just lying idle with a view to avalanching, and on the morning of the 4th, Smythe, Shipton, and Kempson made a cautious examination of the lower slopes, finding them very much better than they expected, although of course all the steps and ropes had long

mp III and the North Col

ago been covered up. After a thorough discussion at a staff meeting it was decided that, if the very greatest precautions were taken, it was justifiable to try again to occupy Camp IV with an assaulting party.

This last effort was most carefully planned in view of the obvious danger from avalanches. The whole climbing strength of the party was to be used, the men working in pairs in turn. Smythe, my second in command, was placed in charge of the operations, and would accompany each pair of climbers, deciding at each stage of progress how much further it would be possible to go. The porters were divided up into small parties under control of Shipton. These parties were to move in succession as the route was made. There was to be no hesitation about a retreat if the conditions were too bad. A very cold night was a promising beginning. Wyn Harris and Kempson were off very early to tackle the first 500 feet. They were not reassured by finding the debris of a small avalanche across their route, but after a careful discussion with Smythe, who had now joined them, it was decided to complete this section. Smythe then went on with Warren and Wigram and they reached a crevasse which marked the beginning of the traverse, the state of which would of course decide for or against the venture. Meanwhile Oliver and Gavin halted the leading party of porters a little lower down and Shipton was still further below with the remainder.

At once it became evident that the snow on the traverse would never hold. Smythe who, as he has told me since, felt that if we did not reach the North Col on this day we should never get there again, made up his mind there and then to try a very difficult line of ascent straight up to the crest. A frontal assault of this nature would certainly be safer than a traverse, and all Smythe's fighting instincts had been roused by our recent disappointments. But this frontal attack was too much for even mountaineers of this calibre; immediately ahead soared two frightfully steep walls of ice, between and beyond which was almost equally steep snow of the very worst description; altogether at least 400 feet of extremely difficult going. I very much doubt if this could have been climbed at the much lower altitude of the Alps; certainly it would have been impossible to bring the porters up. After a very little step-cutting Smythe realized that the game was up and quite rightly gave the order to retreat. Shipton, in frightful anxiety for his beloved porters, had already started them downwards. The retreat was conducted with very great skill, and I for my part shall never forget watching it.

All that evening and next day we were stormbound—this was our one really violent gale of the year. As the tents shook and trembled under the gusts, physical activity had to give place to argument, of the full-flavoured kind which perhaps only high altitude conditions can produce. I missed the cream of it as I was busy writing in my tent. Besides, I should have to make an eventual decision and was better away from the heat of battle. Next morning, when all the snow of this region seemed to be in the air at once instead of on the slopes, Wyn Harris came into my tent with an air of purpose and begged that in the event of the wind falling a little he and Shipton should be allowed to go and have one final look at the slopes, just to see if they had been swept clear. I agreed to this; both men were supremely competent mountaineers and knew exactly what they were up against. They were clearly

The North Peak from Camp IV

Camp IV

Traversing the North Col

determined that the quality of those slopes in these conditions and at this time of year should be ascertained for good and all.

After lunch there was a slight lull and they set off. Smythe and I watched their progress through a little opening in my tent, closing this up at intervals when the gusts were desperately bad, and finally going over to Gavin's arctic tent when the wind became intolerable. Progress was unexpectedly rapid up the first 500 feet, and we began to hope that things were not too bad after all. Then they came to the crevasse and halted to rope up before examining the traverse. Shipton led out across what seemed to be good, hard, compacted snow, well attached to the ice beneath; it held his boot nails well and was not very steep. Wyn Harris had just begun to move in his turn when a sharp crack sounded some 200 feet up. There was a moment's dead silence and then the slope began to move, breaking up as it did so into the blocks of ice characteristic of windslab avalanche. Only a few yards down the slope ended in the brink of a 400-foot ice precipice. Shipton was instantly thrown on to his back and carried down among the ice blocks. Wyn Harris, making a desperate effort, leapt back towards the lower lip of the crevasse and drove his axe deep into the hard snow; as he did so his left hand, which held the coils of rope, was crushed against the axe head and he had to let go momentarily to let the rope run out to its full length. He remembers being thrown on to his back, recovering his feet in a flash, and again jamming the axe into the snow with the rope round it; he was just free of the avalanche. As the rope tightened, Shipton, who had begun to slide from a point roughly on the same level as Wyn Harris, was gradually pulled in the arc of a circle towards the edge of the avalanche, but of course below Wyn Harris. Just when it seemed that the straining rope must pull the axe out of the snow and Wyn Harris with it, the avalanche slowed down and stopped close to the brink of the ice precipice. It is of course impossible that Wyn Harris could by his action have arrested the fall of many hundred tons of ice, but it may be that there was a slight easing off of the slope just before the drop and that Wyn Harris by taking his own weight and that of Shipton and the surrounding ice blocks off the avalanche contributed to its halt. Certainly he did the right thing at the right moment. Shipton was completely winded, and both men were naturally a good deal shaken, but they pulled themselves together and descended to safety without further incident.

There was of course no further argument; the North Col had had the last word. Camp III was completely evacuated and Camp I reached next day. I think we all knew that the mountain was finished with for the year. Transport had already been ordered up from Shekar Dzong, and it was thought that we might employ the interval before its arrival by going up the Main Rongbuk glacier and examining the west side of the North Col, more as a piece of interesting exploration than as a serious attempt to reach the Col by this route. The very next day, June 8, the entire party set off. I wanted Smijth-Windham, who had had a very busy time at Camp I, sending off no less than five hundred wireless messages, to take a holiday. He entirely agreed, provided he could take with him one of his light wireless sets for further experiment. Our first camp at about 18,000 feet was a joy to look upon—green grass at 18,000 feet and in the middle of it a lark's nest with two eggs in it. We

pushed on next day to what was called North Face Camp, near the south-west shoulder of the North Peak, at about 19,000 feet, and next morning went out on to the open glacier towards the Lho La to obtain a view of the Col. That view came suddenly and most dramatically. The slopes to the Col rise out of a little glacier bay, and are not properly visible until you are well out on the glacier. Instead of the very long and steep approach which we had expected, we saw an icefall which could certainly be negotiated, leading up to a not difficult *bergschrund*, and above that perhaps 800 feet of pretty steep snow or ice flanked to the right by ribs of rock not patently unclimbable. This was worth tackling at once, and the climbers made off across the glacier without delay. Unfortunately clouds came down very soon after, and the tired men who returned to the North Face Camp that evening were only able to report that they had forced the icefall without difficulty and gone very close to the *bergschrund*, but had been unable to see anything beyond that.

The mornings at this time were invariably fine, but snow fell very heavily each evening and the mountain was deep under it. Further examination of the slopes did not call for the full strength of the party, and Shipton had always been anxious to renew his attack on the North Peak which had been defeated last year. Accordingly it was arranged that Smythe and Wyn Harris should take a light camp up through the ice fall and close to the *bergschrund* and examine the slopes from there, Smijth-Windham and I remaining at the North Face Camp while Shipton and the other climbers should return up the East Rongbuk glacier and attempt the North Peak, from which an exceptionally good view of the north face of Everest might be obtained.

The now violent monsoon deprived both parties of success; Smythe and Wyn Harris spent a night near the *bergschrund*, just out of reach of the incessant avalanches from the North Peak, and next morning were able to form a clear impression of the possibility of ascent, though at the time they could make no further progress. They are of opinion however that this route is perfectly practicable in good conditions; that it is definitely safer from avalanche, especially windslab avalanche, than the east side; and that there appears to be no particular risk of rock-falls. Further a lodgment could probably be effected on the rock ribs to the right. If this route were made and properly roped by a good party in the early stages of another expedition it might be used as a preferable alternative to the other; at any rate it should provide a safe means of descent to a party cut off by the monsoon on the mountain. Shipton's party meanwhile had bad luck similar to that of last year, and were stopped by deep and impossible snow at about 23,300 feet.

This was really the end; we reassembled at the Base Camp and left for home on June 17. I wish it could have been possible to complete some of the survey work so well begun during last year's reconnaissance; but I had been specially requested by the Tibetan authorities to keep to the routes laid down in our passport, and the repeated thanks we received on our return march for having done so indicated how much this meant to them. I honestly think that our willingness to conform to their wishes has left a good impression, and that as far as they are concerned there is quite a good chance of our being permitted to go to Mount Everest again at no distant date.

A full technical discussion on such information as this sorely tried expedition

The final slope of the crest of the North Col

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has been able to gather for the common stock would be out of place here, but several members of the Expedition have written appendices on their special subjects, of which they will give a brief account if the President calls upon them. It may suffice for me to say that we have now the nucleus of an absolutely first-rate party; that we have explored *au fond* the iniquities of the east side of the North Col; that we have made a sufficient examination of the west side to feel justified in recommending it as an alternative route; that we know a little more about the use of oxygen; that further physiological data have been obtained; and lastly that our examination of the final pyramid, though not alas by actual contact yet by telescope and binoculars, has made us fairly certain that this can be reached by Norton's route and that a choice of three possible ways to the summit presents itself. For my part, I must now cease from active participation in this great venture; but I can never forget the way in which my comrades took the rough with the smooth and made even failure a happy memory. Some day I hope they will return, and that fortune will favour them with fairer conditions; then I am sure they will reach the summit.

APPENDIX I: SELECTION AND TRAINING OF PORTERS

C. J. Morris

This year it was decided that the bulk of the porters should be enlisted in Sola Khombu, and that they should join the expedition direct from that place at the Base Camp. There was no doubt that as many suitable men as were required would be forthcoming; but in order to guard against this arrangement not proving entirely satisfactory some sixty porters were enlisted in Darjeeling, to form the nucleus of the corps. I think some such arrangement will always be necessary since an exceptional fall of snow on the Nangpa La might hold up a Sola Khombu party's arrival at the Base Camp for as much as two weeks, thus causing considerable disorganization to the climbing plans. The problem cannot be solved by ordering the party to arrive at a date earlier than it would normally be required, owing to the difficulty of feeding it, unless some special arrangement were made to overcome this. It should moreover be noted that if the porters are enlisted direct from Sola Khombu no sort of selection is possible; and while the great majority will be, as was the case this year, men in every way suited to the needs of the expedition, quite a number have perforce to be enlisted who would certainly not have been selected had they presented themselves for enlistment in Darjeeling. It is also desirable that as many of the porters as possible should get used to wearing their boots before serious work on the mountain commences. This is only possible when porters are enlisted in Darjeeling; but in any case most of the sardars and a certain number of other men will always be required to supervise the transport during the march across Tibet. In this connection it may be noted that a convention has somehow arisen that Mount Everest porters should carry no loads during the march. This appears to be unnecessary; and while it is obviously not in the best interests of the expedition that these men should carry heavy loads across Tibet, it is in the interests of their training that they should at all times carry something or other.

The system of organizing the porters into sections, each under the command of an under-sardar, was most satisfactory and was appreciated by the men themselves, amongst whom there was always keen competition to gain the coveted

North Col from the west

stripe. Some members criticized this system as being too military; but any one who has had to deal with 150 or so entirely untrained and undisciplined men will quickly realize that some such method is necessary, even if only for the purpose of moving the porter corps from one place to another.

A head sardar, whose chief duty is to see to the porters' feeding arrangements and to ensure that every man does his fair share of work, will always be necessary, but the question of a transport officer, with no other duties, now seems open to question. Many of the younger members now consider a transport officer to be not a luxury but an actual encumbrance; but it should be remembered that a great deal of work goes on behind the scenes, of which they, quite rightly, have no knowledge since it is the transport officer's duty to relieve them of unnecessary trouble; and because everything seems to run smoothly there is a tendency to minimize the importance of the transport officer's duties. The route and methods of conducting expeditions across Tibet to the Base Camp are now well known, and many of the climbers of this year's expedition (and the same will probably apply in the future) have themselves had practical experience of the problem. From most points of view many of these are perfectly well able to supervise the transport and the porters. There are however occasions when it is vitally necessary that some member of the expedition should be able to speak to the men in their own language: this is a very different thing from the smattering of Hindustani which most keen members sooner or later acquire. Moreover the effect is never the same when conversation has to take place through the medium of an interpreter. The men themselves feel very strongly on this point, and will work much better when they know that if necessary they can make a direct appeal to some member of the party. If some climber can be found who knows Nepali or Tibetan really well, then I think there is no need to have a special transport officer. Until such time however even in a small party the appointment of a transport officer does seem to be most necessary, and the retention of such an appointment is in the best interests of the expedition as a whole.

APPENDIX II: TRANSPORT

C. J. MORRIS

As soon as the route was settled arrangements were made to forward the whole of our stores from Kalimpong to Kampa Dzong in batches of roughly one hundred mule loads at a time, thus enabling the climbing party to march through Sikkim unencumbered by the large quantity of transport which would otherwise have been the case.

The roads through Sikkim are for the most part extremely narrow, and unless transport is despatched along them in echelon, as was done this year, there is always liable to be much congestion and even partial disorganization, especially when, as is often the case at the time Mount Everest expeditions normally set out, there is a lot of down traffic. The methods adopted this year for despatching the transport proved entirely satisfactory and should be adopted by future parties.

As soon as we reached Kampa Dzong the whole of the stores were sorted out and checked in detail, all members of the expedition helping in this necessary but extremely laborious work. A certain number of boxes were opened and their contents checked against the detailed list in the stores book. In every case these were found to agree; and since over one hundred boxes were checked in this way it was reasonable to suppose that we were at least starting off from Kampa Dzong with everything intact.

Apart from the actual provision of transport animals, the officer in charge of transport is chiefly concerned to prevent loss and theft on the march across Tibet. In the past losses have occurred in this way, and the matter has always caused considerable anxiety lest some particular box containing, say, important items of high-altitude equipment, go astray. In order to minimize loss it was decided to delegate responsibility to the porter under-sardars. Each under-sardar was given a number of men to serve under him; and before leaving Kampa Dzong each under-sardar was allotted a definite number of store boxes. These boxes were handed over, the nature of their contents explained to the under-sardar; and he was permitted to put his own marks upon them in order to aid recognition. This having been done, each man was told that he was personally responsible for his boxes until such time as we reached the Base Camp. During each day's march both he and the men serving under him were to accompany the boxes, and at least some members of each section were never to let them out of their sight. If, as is often the case in Tibet, any particular party of animals was unable to reach camp by nightfall, then the men in charge were also to camp with the transport, sending a man on to the camp to say what had happened. Whenever circumstances permitted under-sardars were ordered to check their boxes daily, and to report the non-arrival of any particular package. During the first few days it appeared likely that we had lost at least a quarter of our entire stores; but a check by various members of the expedition disclosed the fact that this was not really the case, and the supposed losses were due to the sardars' inability to read numbers, or even to count correctly. This difficulty will always arise until the Sherpa takes to education; but provided a certain amount of help is given them, and advantage taken of halt days to carry out a general check, the methods adopted this year should prove entirely satisfactory. As it was, our total losses on arrival at the Base Camp were found to be nothing more than a few tins of soup; and it seemed likely that these fell out on the way.

In order to facilitate the work on the actual mountain it is essential that all those concerned should know exactly what any particular box or package contains. For this reason it is important that as few people as possible should have access to the boxes during the march; and that anything issued or removed from a box should be entered *at the time* in the store book concerned. It seems almost unnecessary to mention a simple routine matter such as this; but in actual practice it is so often neglected, and liable to cause such endless confusion and delay on the mountain, that I feel it essential to place it on record. For the same reason keys should be given only to those members who are actually required to deal with boxes; otherwise indiscriminate opening of boxes takes place, no record is kept of stores expended, and by the time the expedition reaches its base the store book is completely valueless.

APPENDIX III: WIRELESS

W. R. Smijth Windham

This is not the place for wireless technicalities, but I will endeavour to state as briefly as possible what were the wireless arrangements, and what in general are the advantages and disadvantages of taking wireless on a Mount Everest expedition.

I returned to England early in December 1935, and was told to carry on with the organization of the wireless in accordance with my own ideas. I regarded the main function of the wireless as being the means of rapid transmission of weather forecasts from their source at Calcutta to those who would use them,

namely, the climbers. It will be simpler if I deal with this in three phases: Calcutta to Camp I; Camp I to Camp III, and Camp III upwards.

Firstly, I arranged for a station to be established at Darjeeling which was the nearest point in civilization with the necessary facilities. It was excellently run by two N.C.O.s (Sergt. Frawley and L/Cpl. Maudsley), and was equipped with a telegraph circuit by which weather and other telegrams could reach the station quickly, and with W/T whereby messages could be retransmitted to me at Camp I.

The plan was for Ruttledge to be at Camp III. I would have liked to be there too, but there was one big disadvantage—Camp III was liable to evacuation owing to bad weather. I chose Camp I, which is quite high enough when one considers swinging the starting handle of a charging engine on a cold morning.

The equipment at Camp I consisted of a specially modified Norman Lyon charging engine, which supplied power to a bank of accumulators presented by Messrs. Young, from which was driven an Eddystone short-wave transmitter, which put some 50 watts into the aerial on a frequency of 7 mcs. per sec. An Eddystone short-wave receiver was to receive signals both from Darjeeling and from Camp III.

So far so good. Then came the difficult problem of communication with Camp III. No member of the party besides myself had any experience of wireless. The obvious solution was a field telephone circuit, but it would have cost over £150. The only alternative was wireless, very portable wireless with limited power, probably involving the use of the key rather than the microphone. I bought a Marconi battery-driven transmitter and receiver for Camp III and a similar transmitter for Camp I, and forthwith enlisted Gavin as my disciple. He, with Ruttledge, Humphreys, and Oliver, were made to attend morse classes, and his enthusiasm was such that by the time we reached Everest he erected and took sole charge of the Camp III wireless in a manner quite above criticism. We became known to the porters as the Bijli Sahibs; the more erudite of them even used the term Wahlis Sahibs.

If all went well, our weather forecast would reach Camp III from Alipore in, say, two hours. But it would still be useless to the assault party high up on the mountain if it could not reach them by the same evening. The requirements were extreme lightness and simplicity. Fortunately these could be met by the use of wireless working on ultra-short wavelengths (5 metres). Fortunately, too, the layout of the mountain is right, for these radiations are very similar to light rays, and require a straight uninterrupted path. Sets were designed by Eddystone with an all-in weight of 28½ lbs., and two specially light ones for Camps VI and VII weighed only 15 lbs. They could be erected in about three minutes, they transmitted speech, and in use required only the operation of one knob, the send-receive switch.

I may leave to the imagination the tiresome details of packing and shipping, the harassed checking of boxes at Darjeeling, and the daily anxieties of the march, with its bumping and boring, its bucking off of fragile loads, and its muleteers who use one's petrol cans as firebricks, and pass to Camp I, where Gavin and I started unpacking on April 27. As exercise I commend to you the driving of iron mast-pickets into rock with a 7-lb. hammer at 18,000 feet.

By May 1 we were through to Darjeeling; by May 9 Gavin had worked to me from Camp III, and when Smythe and Shipton occupied the North Col they found the 5-metre wireless to Camp III as good as a domestic telephone, or so they said.

There is little more to add, save that when the party went up the main Rongbuk Glacier to examine the North Col from the west, I accompanied them with

skeleton equipment. I used the Marconi transmitter whose range is given by the makers as 5 miles. By fitting an aerial with a specially high angle of radiation I was able to send signals over the North Peak, which was immediately above us, and bounce them down to Darjeeling on the other side, 110 miles away. Reception was good, too, particularly from the B.B.C. I remember well eight of us, in my six-by-four tent, listening to every word of the commentary on the first Westchester Cup match. My point is that should the western route be decided upon as the line of attack on a future expedition, the North Face Camp will form an even better wireless H.Q. than did Camp I this year.

That brings me, in conclusion, to the pros and cons of wireless on Himalayan expeditions and on Mount Everest in particular. It is a very controversial question, but I feel it is important that a future leader should have all available information before making his decision. Taking the objections first: The wireless this year cost roughly £1000. Of this £500 was spent on equipment and the other £500 went on transport and on personal clothing, messing, fares, etc., for me. The total might have been less had I had more time in England before starting, and might have been cut down by a less comprehensive wireless plan. But one must guard against spoiling the ship for a ha'p'orth of tar. Also, I understand that the proprietors of the *Daily Telegraph* gave an extra £500, on condition that the reports from the expedition were sent by wireless, and gave £500 extra towards the cost, so that the net expenditure amounted to about £500.

Secondly, it has been and is being argued that every member of the expedition should be a potential starter for the summit: this on the ground not only of cost but also, it is said, of reducing numbers in order to make the party less unwieldy in its march across Tibet. I leave it to be decided whether the general is to go over the top, bayonet in hand; certainly if he does he need have no experts behind him, for he will have committed himself irrevocably.

Thirdly, in certain cases wireless bulletins have undoubtedly increased the anxiety of relations; but I am doubtful how much weight should be given to a disadvantage of this kind.

Now for the advantages. Is wireless useful? In six weeks I dealt with 549 messages, of which about 350 were weather messages, about 120 were on expedition business, including press, and 80 were private. This takes no account of the many messages concerning supplies and porters which passed between Camps I and III, or of tactical messages between Camps III and IV. The evacuation of Camp IV was carried out after full discussion by wireless telephone with the leader at Camp III.

Secondly, are weather messages useful? Although in a year like this they served mainly to intensify the general gloom, I think the answer must be Yes. But a word of warning is necessary here. The Indian meteorological authorities have repeatedly stressed that they cannot help Everest if Everest does not help them. Without an observatory north of the Himalaya they must rely on information from the mountain. That involves a wireless transmitter and therefore a wireless operator. Now it has been suggested that wireless might be taken without a wireless operator. In my view that would lead nowhere. If you sacrifice a wireless operator you must sacrifice a great measure of reliability not only in the actual working of the wireless, if indeed it works at all, but also in the weather forecasts, for if there is nobody to observe the Everest weather and transmit details to Alipore, Alipore in turn cannot make forecasts.

There is only one question to decide here, whether to take full wireless equipment with a wireless specialist who might well know something about meteorology too, or to take nothing at all. That is the question, and if I told you my answer you would accuse me of being biased.

APPENDIX IV: PHOTOGRAPHY

F. S. SMYTHE

Everest has been photographed so often that from a topographical standpoint little remains to be done on the Tibetan side of the mountain, though of course the scope of the stereo-photogrammetric survey of the district could be extended indefinitely. The main objects of photography are to bring back a record, personal and topographical, of an expedition in which must be included a record of the meteorological and snow conditions on the mountain.

Of recent years the development of the miniature camera which uses 35 mm. film and takes thirty-six exposures on one film has greatly assisted mountaineers and explorers to whom bulk, weight, and ease of manipulation are first essentials. The production of film of fine grain which enables such photographs to be enlarged satisfactorily to about 12 by 10 inches and reproduced as good lantern slides has rendered such apparatus and film particularly suitable. At the same time larger films are still more suitable where greater enlargements are desired, and the best camera in my opinion is the 6 by 9 cm. "Etui," which weighs only 1 lb. (as against about 2 lb. of the "Leica" type of miniature camera) and which uses film packs. The sole disadvantage of such a camera as opposed to a miniature camera is the necessity of changing film packs more frequently, a chilly operation at high altitudes and one calculated to reduce the number of photographs taken, a point lamentably evident in the few photographs taken by expeditions above the North Col.

The 1936 expedition was equipped with various cameras ranging from miniature size to quarter-plate, and with these excellent results were obtained on Kodak "Panatomic" film, a film of panchromatic quality well suited to mountain photography.

Light values are not easy to estimate, and the tendency has always been to under-exposure during the march through the Sikkim valleys, where water vapour reduces values, and to over-exposure on Everest, where the value is very high. Exposure meters are of little value owing to the varying proportion of ultra-violet light as height is gained, but it should be possible to evolve a compensating table to aid the photographer who uses a photo-electric exposure meter.

Filters are necessary during the march through Sikkim and across Tibet if the best results are to be obtained, but are not so desirable above the snow-line as they tend to over-correct sky tones. Examples of this will be found among the photographs taken by former expeditions, in which the sky appears unnaturally dark. These photographs are often effective but do not represent landscapes accurately, and accuracy is an ideal to be aimed at in photography on Everest. The best mountain negative is one not too dense and with detail present in shadows and high lights, particularly the latter if a soot and whitewash effect is to be avoided, a common failing of mountain photographs.

The most common criticism of Everest photographs is that they convey little idea of the scale of the mountain. This is inevitable but can be remedied to some extent by careful composition and the juxtaposition of a tent or human figure in the foreground or middle distance. Unless a special effect is desired or the photograph is to be purely a topographical one, a human figure does add to the interest, especially to those who have not seen Everest.

The mere pointing of the camera at a scene of grandeur and beauty, coupled with the correct exposure, is not enough, and the result is too often disappointing. Balanced composition is perhaps more important in mountain photography than in any branch of photography, and the photographer, who would like to

do justice to his subjects, would do well to spend some time studying the principles of composition; in this a visit to an art gallery is an illuminating experience, as precisely the same principles apply in landscape painting. The aim of the photographer must always be to lead the eye forward, as it were to a climax, and this is only accomplished by correctly balancing foreground with middle distance and background and by correctly apportioning sky to landscape. For instance the insertion of a single pine tree in the foreground of a mountain picture against a background of mountain transforms an otherwise dull picture into something artistic and beautiful. There are no trees on Everest, but some kind of foreground object is usually available.

Thanks to the generosity of Kodak, Ltd., it was possible this year to obtain a cinematograph record of the expedition. This was taken on supersensitive panchromatic film and the apparatus employed was a "Special Cine-Kodak," two "K" models and one "B.B." model "Cine-Kodak." In addition, a quantity of Kodak "Kodachrome" film was employed, thus enabling the first cine pictures of an Everest Expedition in colour to be obtained. Before our departure I was warned by Kodak, Ltd., not to use "Kodachrome" film where an important picture could not be duplicated in black and white, as the film was then in its experimental stage, and it was doubtful if it would remain unaffected by climatic changes, in particular the damp heat of India during the monsoon season. Some of the film was ruined by climate, but a greater proportion processed well. It was found to require a greater exposure than originally recommended, and I would now suggest an exposure of between eight and sixteen times more than that necessary for the supersensitive panchromatic film. No filter except a haze filter for distant views is required for this film and, except that it demands a greater accuracy of exposure owing to its lesser latitude as compared with black and white film, it is as easy to handle as the latter. It is also worth noting that although it is not yet possible to duplicate this film in colour excellent black and white copies can be made from it.

As regards the supersensitive panchromatic film, red Wratten filters were employed, and though good results can be obtained without them I would unhesitatingly recommend them to be used during all stages of an expedition. In this connection it should be pointed out that the quality of a cine film is necessarily somewhat different from that of a "still" film, and any tendency to over-correct skies is preferable to under-correction when the film is projected on to a screen. Elaborate apparatus is unnecessary and the numerous appliances on the "Special Cine-Kodak" were never employed. Thus the camera was unnecessarily heavy.

Telephoto lenses are essential. They enable the complimentary picture of a middle distant or distant picture to be taken, a function of all good cinematography, and the camera therefore should be fitted with a turret head so that the telephoto lens can be brought into use without delay or the necessity to fiddle with cold fingers.

The importance of a good stand cannot be over-emphasized. If it is worth taking a film at all it is worth while using a stand on every possible occasion. On a large screen, such as is employed in the Society's Hall, the slightest tremor is brought into prominence, and at high altitudes where breathing is more rapid, or after muscular fatigue when the body is unsteady, it is impossible to take steady pictures without a stand, or some form of support.

APPENDIX V: SNOW CONDITIONS ON THE NORTH COL

F. S. SMYTHE

From the point of view of danger the ascent of the North Col from the head of the East Rongbuk Glacier presents considerable problems, and a study of the history of this route shows how diverse are the conditions with which climbers must contend.

In 1921 the Col was reached without incident towards the end of the monsoon season, though Mallory in his account mentions frozen avalanche snow. In the light of subsequent experience however it is probable that the party exposed themselves unknowingly to considerable risk.

In 1922, shortly after the monsoon had broken, seven porters lost their lives in an avalanche.

In 1924 no avalanche occurred except for a minor snow slip during the rescue of some porters who were marooned by pre-monsoon snowstorms on the Col.

In 1933 the party on one occasion retreated owing to a snow formation resembling a windslab, and Camp IV, which was on a ledge some 300 feet below the crest of the Col, had to be moved on to the Col owing to the risk of an avalanche overwhelming it from above. A reconnaissance after the monsoon had broken disclosed dangerous conditions.

In 1935 a large avalanche occurred shortly after the establishing of Camp IV which involved a considerable portion of the route.

In 1936 after the abandonment of Camp IV prior to the monsoon the slope was heard to crack at one place. The same thing was heard later on another part of the slope after the monsoon had broken when an attempt was made to re-occupy Camp IV, and finally Wyn Harris and Shipton narrowly escaped disaster when an avalanche was detached during a reconnaissance of the route.

All the major avalanches so far observed on the North Col have been of the slab type. The upper stratum of snow has slid off *en bloc*, breaking up into minor blocks as it did so. This is characteristic of the windslab, for the formation of which the east face of the North Col is peculiarly suited. The prevailing wind is from the west or north-west, and even during the monsoon when the prevailing air current is from the south it would appear that it passes over the 19,000-feet Col known as the Lho La to the west of Everest and is then deflected against the west slope of the Col. Thus the snow is blown over the crest of the Col and settles on the lee side. This, though one of the conditions necessary in the formation of windslabs, is not the only condition. It has been established by scientific experiments in the Alps that a certain percentage of humidity is also necessary. Mr. G. Seligman gives this as about 85 per cent. No measurements of humidity have been taken at or above 22,000 feet on Mount Everest, but the available evidence points to the fact that whereas before the monsoon air current reaches Everest the percentage of humidity is less than 85 per cent., after it reaches Everest it exceeds 85 per cent. during the greater part of the monsoon. From this, and the evidence already known, it would appear certain that whereas it is justifiable to ascend the North Col from the east prior to the incidence of the monsoon current, it is unjustifiable to ascend it after its arrival.

The problem however is not so simple as it sounds. By "arrival of the monsoon" expeditions in the past have assumed this to mean the first heavy precipitation of snow on Everest which is not quickly removed by the north-west wind and which is accompanied by a marked rise of air temperature. From the point of view of safety or danger on the slopes of the North Col such an assumption is wrong. Monsoon precipitation may be preceded by a rise of air temperature and humidity slight enough not to be noticed by a party unequipped

The North Face Camp

with measuring instruments yet sufficient to induce avalanches. Thus, a party might continue the ascent in good conditions on the upper part of the mountain yet be overwhelmed by an avalanche on their descent of the North Col. Such a possibility makes careful observation essential, and if the same route to the North Col is to be followed by future expeditions I would strongly recommend the taking of instruments which should be under the charge of some competent person.

In 1936 I believe such conditions as already described did actually occur, as when Shipton and I made the descent of the North Col after abandoning Camp IV the snow was in a dangerous condition and on one occasion cracked ominously beneath me as I was exploring it ahead on a rope. As even a small avalanche is likely to involve a party in disaster owing to ice-cliffs which are almost everywhere below the route, no precaution to avoid such danger can be too elaborate.

A windslab is the most difficult of all snow conditions to detect. The climber is lulled into a sense of false security by apparently firm snow which may be so hard on the surface as to necessitate step cutting. Such a condition obtained when Wyn Harris and Shipton made their reconnaissance which nearly ended in disaster and the avalanche which occurred was a typical windslab. For the past few days, and particularly during the morning before this incident, a strong north-west wind had been blowing. This was sweeping the face of the North Col almost horizontally, and I for one had no fears for the party and was of the opinion that the wind so far from forming windslab was consolidating the snow into a safe crust. In this I was mistaken.

It cannot be too strongly urged that Everest climbers should visit the Alps during winter whenever possible so as to gain experience in windslab avalanches. Only through such experience is it possible to detect a windslab. A windslab can be detected both visually and by the feel of the snow. In appearance the snow is smooth but rippled by wind at the edges of the slab. In feel, though it may, as already noted, be hard, it possesses a curiously velvety texture which is particularly noticeable when ski-ing.

Though it may be safely assumed that the avalanche which nearly overwhelmed Wyn Harris and Shipton was an ordinary windslab such as is common during winter in the Alps, the far larger avalanche which occurred in 1935 was a more complex affair. The monsoon then was well advanced and air temperatures and humidity had been high for some weeks. The slab was fully 6 feet thick and covered a considerable area; the avalanche must have weighed tens of thousands of tons. During their ascent the party found the snow reasonably firm and apparently safe. The night temperature at Camp IV was low, yet the avalanche occurred, it is thought, early the following morning. Had the snow been wet and sticky the party would have turned back, for wet snow avalanches such as are common in the Alps during spring and summer are easy to detect, and the party was a competent one, and one member at least, Kempson, had had considerable experience of Alpine winter snow conditions.

Shipton's theory is that weeks of monsoon weather had rotted the snow, but this is not a sufficient explanation. It may be that the avalanche was a combination of windslab and waterlogged snow. It cannot have been formed of purely waterlogged snow, otherwise, as already mentioned, it would have been detectable and the low overnight temperature would have held it *in situ*. There is the possibility that it was detached by an abrupt movement of the ice-fall on which it rested—a possibility that deserves consideration when ascending the east side of the North Col and one which militates against this route. From the available evidence it would appear to have been of a similar type of avalanche to that which overwhelmed the seven porters in 1922, though on that occasion the

The west side of the North Col from the high camp

snow was considerably softer and the climbers were sinking several inches into it.

It is possible that the avalanche was a windslab which formed some time previously, but that it was not one which readily avalanched of its own accord. Subsequently it was covered by monsoon snow and the weight of this plus a movement of the ice-fall eventually dislodged it. I have on one occasion seen such a condition in the Alps when climbing on ski the Schilthorn above Mürren. In this case a windslab had become covered by several inches of new powdery snow. The latter appeared quite safe as it was loose and crystalline in texture. Nevertheless the hidden windslab beneath cracked, but fortunately did not come away. It is difficult to imagine any more treacherous and incalculable form of avalanche than this. Neither visually nor by feel was it detectable, and the only possible clue in dealing with such an avalanche is previous knowledge that a windslab has formed coupled with knowledge of the direction of the wind during the snowfall which resulted in the formation of the slab. Neither in my case nor Shipton's was such knowledge available, and this in itself is sufficient proof that the North Col is very dangerous during the monsoon season and should be left severely alone.

To sum up, there is no doubt that a route should be made if possible up the west face of the North Col. This face being on the windward side of the Col is certain to have safer and more easily calculable snow. Windslabs are unlikely, though it is not impossible for them to occur on a windward face. If a rock rib is followed the climber need ascend no more than 300 feet of snow, and if the worst came to the worst and an avalanche occurred he has a better chance of escape as there are no ice-cliffs below him.

It is probably more difficult than the east face and may take a longer time to force. If the next expedition arrives a month earlier at the base camp there will be ample time for this, and the ascents and descents in making the route will serve to acclimatize the party, for it is certain that acclimatization is better gained through a number of ascents and descents than through residence at any particular altitude.

This does not rule out the possibility of the eastern route. This may be assumed safe in pre-monsoon conditions except after a heavy snowfall, but a route on the west side of the Col, even if not used to the exclusion of the eastern route, would serve as an alternative route in the event of the arrival of the monsoon air current finding the climbing party on the upper part of the mountain or in position to attack at Camp III. In 1936, when much of the snow was swept from the mountain by a north-west gale after the first monsoon precipitation and the party was in the unfortunate predicament of being unable to attempt the summit owing to dangerous conditions on the east face of the North Col, it is probable that the west side of the Col was practicable.

Finally, it should be emphasized that Himalayan snow cannot obey different laws to Alpine snow, but that its study is complicated by swiftly changing and more varied conditions in which a greater range of solar temperature and changing air temperatures and humidity due to the monsoon play the principal part. And allied to these factors high winds and heavy snowfalls must be added.

I have dealt only with the practical aspects of snow conditions on the North Col and have endeavoured to outline the problem as seen from the mountaineer's standpoint. I leave those more expert than I to add to our theoretical knowledge of an intricate subject. There is a considerable literature, and I would especially bring to the attention Mr. G. Seligman's book, 'Snow Structure and Ski Fields.'

APPENDIX VI: HEALTH

DR. NOEL HUMPHREYS

The problem of climbing Mount Everest, which is really the problem of the last thousand feet, resolves itself into the double problem of health and weather. The problem of getting permission to enter Tibet, that of finding a route to the mountain, that of the organization of the expedition, have all been solved. The expedition this year went like clockwork. The mountaineering difficulties of reaching 28,000 feet had been overcome on three occasions by previous expeditions and the way beyond this to the summit has been seen and the technical difficulties are considered well within the capacity of experienced mountaineers. Of the two factors, health and weather, the latter is outside our control, but the former was a matter of great consideration by the Everest Committee and the leader of the expedition.

Whether without the aid of artificial oxygen it is possible to climb, or even remain conscious, above 28,000 feet is still unknown. From experiments in decompression chambers it is found that consciousness is lost at or before an atmospheric pressure corresponding to that height, and it may be more than a coincidence that this is the exact height at which three parties of Everest climbers have had to turn back. Some mountaineers however point out that experiment cannot exactly simulate conditions in the field. In the decompression chamber the subjects are introduced to rarefied air without previous acclimatization, whereas climbers on Mount Everest have been living for weeks at a height of approximately half that of the mountain they are on their way to attempt. Moreover it has been remarked that no Himalayan climber has actually become unconscious from the effect of height, whereas in decompression chambers some subjects become unconscious at a pressure corresponding to a much lower height than has been reached on Mount Everest. It is possible therefore that loss of consciousness in the decompression chamber is due to change of atmospheric pressure rather than the amount of pressure. Unfortunately the weather factor this year prevented the health factor, at very high altitudes, coming into play.

That there is steady physical deterioration at altitudes above 21,000 feet was the opinion formed by scientific experiment, and has been confirmed by the experience of Mount Everest expeditions, including that of this year. It is also known that simultaneously with deterioration there is adaptation to the conditions. These simultaneous processes may be compared with those manifested by the drug addict, who, while steadily deteriorating physically, is yet adapting himself to withstand the effects of larger and larger doses. The rate of deterioration would appear to be constant for any one climber at any one height, but the discovery of former Everest expeditions, confirmed by experience this year, was that the rate of adaptability could be increased. Climbers who had been on previous expeditions to the mountain acclimatized more quickly than those who were being tried out for the first time. Moreover on any one expedition each successive excursion above Camp I showed an increased speed of acclimatization.

Unfortunately there is no known method of forecasting the speed of acclimatization for any individual climber untried at great heights, and this makes the selection of a team for the expedition a difficult matter. The method adopted was first to appoint climbers who on previous expeditions had shown a good power of acclimatization to heights. For the rest of the team, from among a large number of first-class climbers preference was given to those with outstandingly good medical reports, and from among those preference was again given to those with Himalayan experience. The medical tests were made by the medical staff

of the Royal Air Force who are accustomed to make examinations with a view to ascertaining a candidate's fitness to withstand the effect of great height. After the team was selected further precautions were taken. The members were vaccinated and inoculated against typhoid. X-ray photographs were taken of their jaws in order to detect any latent abscesses, at the apices of the teeth, which might flare up when vitality was reduced by living at a great altitude. A number of teeth were extracted as a result of the X-ray reports, and this treatment would appear to have been justified as only one tooth had to be extracted during the expedition and this from a member who had joined from abroad and so escaped the careful examination of candidates joining from England. Among the Europeans there was only one case of serious illness: benign tertian malaria, which was successfully treated.

The medical equipment taken was based on the experience gained on previous Everest expeditions and was ample and comprehensive. Surgical instruments were taken which would enable us to perform major operations, if necessary. The size of our medical equipment was influenced by our intention of doing what medical work offered among the native population of Tibet, and this work took up a good deal of the time of the medical officers, but was very satisfactory in the goodwill it occasioned. On the march over Tibet there was almost no sickness among the members of the expedition. There were certain alimentary disturbances, occasioned probably by mica in the drinking water. A few of the Europeans suffered very slightly from mountain sickness when first reaching the plateau of Tibet. Sore throats started before we reached Base Camp. At Camp III however the effects of height were felt by every member of the expedition, who all suffered from some of the following complaints: headache, sore throat, breathlessness, lassitude, loss of appetite, nausea, vomiting, insomnia, indigestion, diarrhoea, and such visual disturbances as diplopia and "blacking out." These were the effects of height on exceptionally healthy people. Few complaints could be treated successfully. Headaches yielded to aspirin, and insomnia to chloral hydrate, but no treatment was successful with the throats, many of which were badly ulcerated.

Whenever it seemed that the snow conditions on the North Col would prevent useful work from Camp III, the expedition was withdrawn to Camp I where an improvement immediately set in. It was very noticeable that each time the expedition returned to Camp III acclimatization was more rapid. After our final retirement from Camp III muscle wastage was very marked, and even the 250 miles' march back to Sikkam left our muscles smaller than when we had entered Tibet, three and a half months before.

APPENDIX VII: PHYSIOLOGY

C. B. WARREN

The journey up to the higher camps on Mount Everest calls forth individual physiological adjustments which are of peculiar interest not only for study, but also for the practical bearing which they have upon the success or failure of the whole venture. It is coming to be realized that the climbing of the mountain is now almost as much a physiological problem as a mountaineering feat. Questions which still have to be answered are: At what altitude does deterioration set in? Does further acclimatization take place above the level at which the body shows signs of deterioration? Is it possible to climb to 29,002 feet without using oxygen?

As a result of experiments with animals which were kept at low atmospheric

pressures for a considerable time, Sir Leonard Hill and Argyll Campbell came to the conclusion that it was useless to attempt to acclimatize to altitudes greater than 21,000 feet; above this altitude their animals eventually died, and when examined were found to have dilated hearts and fatty degeneration of all their organs. As a result of experience gained on the last three expeditions we are coming to acknowledge that the physiologists may have been right after all when they put the greatest altitude at which man can live and thrive at this same level; for since the expedition of 1933 it has become a principle that the longer a climber is kept above Camp III (21,200 feet) the more does he deteriorate.

In these circumstances it may not be out of place to reconsider the whole problem from the physiologists' point of view, and to consider once again whether their advice on the matter of oxygen should not be given greater consideration in the future.

The first stages of the march to the mountain carry one steeply and rapidly from the plains of India to the high Tibetan tableland; there is a rise of some 16,000 feet in the first 70 miles. During this period of the expedition the more acute signs of mountain sickness are likely to be prevalent, and these are—shortness of breath and a feeling of suffocation on the slightest exertion, blueness of the lips, ears and fingers, headache, and vomiting. At such a time the emergency methods of acclimatization are being brought into play, but the slower and more permanent adjustments, such as the increase in the red cells of the blood, have not had time to come into action.

Both this year and during the Reconnaissance of 1935 it was noticeable that people suffered from the altitude most acutely on reaching Tangu. In a report on "The Medical Aspects of the 1935 Reconnaissance Expedition" I said: "At Tangu (12,000 feet up) frequent are the records of distress in the visitors' book left by parties visiting the bungalow and passes in the neighbourhood. And our own experiences showed that even those accustomed to such changes can succumb: for all seven members of the expedition suffered in varying degrees from symptoms which were due to the altitude." And this year the only place at which vomiting occurred as a symptom due to altitude was Tangu. Here we waited for several days before tackling the pass (Kongra La, 16,000 feet) into Tibet, with the result that we presented a far less pitiful spectacle than the party of 1935 did when making the same crossing.

Once the pass has been crossed the route to the mountain runs for some 200 miles across comparatively level country, but all the time at altitudes greater than 13,000 feet. Here conditions are ideal for stimulating more permanent acclimatization. In most members of the party the blood count had increased by at least 20 per cent. before reaching Base Camp (16,600 feet), and in some cases had even advanced to 30 per cent. above the normal level. And with the advent of these changes had come relief from the urgent symptoms: the lips were no longer livid, our headaches passed away, and the breathing was no longer deep and rapid and there was no longer a feeling of suffocation on exertion. Indeed we arrived at Base Camp feeling almost as well as at sea-level; in fact Wyn Harris, who had come straight from Africa to join the expedition, was a great deal fitter on arrival at Base Camp than he was when he started from Gangtok.

A characteristic which has been described as being peculiar to native peoples who dwell permanently at high altitudes is the shape of the chest, which is deeper and of greater capacity than that of persons living at sea-level. A greater capacity of the chest would mean that a greater area of the lung was exposed to aeration. In order to see if our own lungs increased their capacity as we went

higher we measured the vital capacity of the lungs. To do this the subject is instructed to inspire as much air as possible. When his chest is full to bursting point he is made to blow out the air into a gas meter until he can expel no more. The volume of the gas expelled is measured by reading a dial. In some members their vital capacities had increased by the end of the expedition by 27 per cent. This is another of the slower adjustments by which acclimatization can be assisted.

It is obvious that there is a limit to such processes as that just mentioned, and it is of importance to us to try and discover the altitudes at which these compensatory processes are still taking place, and where they cease. It is also important to know just where the destructive processes of deterioration begin to set in. Is acclimatization still going on when this happens?

After the first attempt to get above the North Col this year we all retreated to Camp I after being up at Camp III for a period of eleven days because it was thought that the strength of the party would improve with a period at a lower level. Morris and Smijth-Windham were both at Camp I, and they told me afterwards that we all looked thin and ill when we first came into camp. It was also noticeable that people began to eat with their accustomed appetites as soon as they got down to 17,700 feet at this camp. In every case except one there had been a loss in weight, though this was much less marked than in 1935, when we spent longer above this altitude. In 1935 there was even a gain in weight, in one instance as much as 9 lb., after five days spent at Rongbuk.

At Camp III sore throats were prevalent, and on retreating to lower levels there was generally a marked improvement in these, though they did not in most cases clear up completely.

From all Mount Everest expeditions there have been reports of altitude sore throats, and both this year and last year, at one time or another, almost every member of the party suffered. From the point of view of keeping the climbers fit for their task the problem of their prevention is a major one. There is no doubt as to the cause of the condition. Normally the throat and nose contain bacteria which are harmless: the "normal buccal flora." But by breathing the unusually dry air of the north side of the mountain through the mouth instead of the nose (for when you are panting for breath mouth-breathing is the rule) it escapes its one chance of being moistened, and the result of this is that the cells lining the upper respiratory passages over which it passes become dried up. In this state they are liable to invasion by the normal buccal flora. In some cases the throat was actually ulcerated; whilst in most instances the sufferer was left with an irritating cough. With Shipton the infection spread to his larynx, so that he lost his voice and could only issue orders in a hoarse whisper. There was a noticeable improvement in the sore throats as soon as the moisture-laden clouds of the monsoon began to pour over the passes on to the East Rongbuk Glacier. When climbing in Garhwal on the southern slopes of the range these throats were not a common feature of life at high altitudes.

The application of liquid paraffin with a spray so as to form a protective film over the throat would seem to be a rational form of treatment, but this was tried and found to be inadequate. The best method to insure that the air breathed was properly moistened would be to wear a mask of the Matthews' respirator type when taking exercise high up. With this mask the moisture in the expired air is condensed on a pad of copper gauze, and with inspiration the air taken in is moistened and at the same time warmed by passage through the gauze. It would only be a matter of training to get used to wearing the respirator; it need not be worn all the time.

What further evidence have we that deterioration may be taking place at

21,000 feet? The pulse rate may give us some indication as to what is happening. The "basal pulse rate" is the number of beats per minute of the pulse when taken the first thing in the morning with the subject lying quietly in bed. In normal circumstances the frequency remains very constant for each individual. Any effort, such as turning over in bed, will send the rate up. It was found that in only two of the eight climbers tested was there no appreciable increase in the basal pulse rate up to altitudes of 21,200 feet. In five out of eight the frequency was constant below 17,700 feet (Camp I). And in one of the eight it was constant below 16,600 feet.

This year no one was exposed to the strain of going really high, so dilated hearts were not to be expected. Only once was the whole party examined, and that was after coming down from Camp III for the first time. On that occasion there was no evidence of strained hearts. But when going back up to III later on, at a time when I was ill with a sore throat, I did notice that my own heart was making extra beats.

So much for altitude deterioration. Have we any evidence that acclimatization is still going on at 21,000 feet? To begin with, let it be said that we all felt much less distress when at Camp III on our second and third visits than we did the first time up there. Our only other evidence is derived from the blood counts. Between the time of our first visit to Camp III and our final return to the Base Camp at the end of the expedition there was in most cases further increase in the red cells and the haemoglobin content of the blood. So this much at least can be said, that our later stays at 21,200 feet did not prevent the blood count from continuing to rise.

In conclusion, the evidence which points to deterioration taking place at 21,200 feet is: Loss of appetite, with wasting and loss of weight which is rapidly regained on going to lower levels; an increase in the basal pulse frequency which is only present above 16,600 feet; in animal experiments, the inability to prevent them from ultimately dying with fatty degeneration of their organs; and possibly the occurrence of undetected extra systoles of the heart.

And that which would lead us to believe that some acclimatization is still going on is: That the climbers were less distressed on their later visits to Camp III, and that living at Camp III did not prevent a further increase in the red cell counts of our blood.

APPENDIX VIII: THE OXYGEN PROBLEM

C. B. WARREN

The carriage of oxygen in the blood and its function

When a man goes to a high altitude he has to breathe an atmosphere which contains less oxygen than there is at sea-level, though the proportion of oxygen to nitrogen remains the same: that is, oxygen still forms 20 per cent. of the atmosphere. What has altered is the barometric pressure, so that the pressure exerted by each of the gases composing the atmosphere has altered also. Oxygen passes from the air in the lungs into the blood, which is circulating through those organs as a result of the pressure exerted by the gas. The amount taken up depends upon the pressure at which the gas is delivered to the blood. If the partial pressure of oxygen in the breathed air is reduced as it is at high altitude (and in low-pressure chambers at sea-level), then less of it is taken up, the blood leaves the lungs less fully saturated with the gas and so has less to deliver to the tissues. The tissues must be supplied with oxygen at a definite pressure if their life and function is to be maintained. It is lack of oxygen to the tissues which

gives rise to symptoms, and which calls forth the adjustments which are made by the body in order to adapt itself to the new environment. When the partial pressure of oxygen in the breathed air is reduced beyond certain limits, symptoms which have nothing to do with the bodily adjustments, but which are directly attributable to the diminished pressure, are met with. For instance, if an airman rapidly goes to a great altitude he will lose consciousness without warning. The same thing happens if he is put into a closed chamber at sea-level from which the air is rapidly exhausted.

In 1875 Tissandier and his companions made their famous ascent in a balloon from Paris. At 26,500 feet Tissandier lost consciousness. He recovered to find the balloon descending, but his two companions were dead. It has been suggested that such an accident might happen on Everest if a climber went beyond the present highest point reached. But I do not think such a thing would be possible when we consider what happens when the oxygen pressure is reduced more slowly. He is more likely to be exposed to another kind of danger. With a more gradual onset of anoxia the train of symptoms is as follows: The intellect and the senses become dulled without the subject being aware of what is happening. Visual acuity is diminished and sensation impaired. The subject may be in danger and not realize it; or he may realize his danger and yet be incapable of deciding upon a line of action which would put him in safety. Finally there is paralysis of the legs and arms, and ultimately loss of consciousness. On the extreme heights of Everest the climber is likely to be brought to a standstill by the fatigue in his muscles (or if you like actual paralysis) long before he would lose consciousness. He would however be exposed to dangers due to mental impairment, such as the failure to realize the danger of his position and carelessness in his movements on difficult ground. Apart from the fact that it may not be possible to reach such an altitude as 29,000 feet without oxygen, I think that the dangers consequent upon mental impairment form the strongest argument in favour of its use on the last lap.

The apparatus, and its use on the mountain

Whatever the type of apparatus used, its object is to increase the pressure of oxygen in the alveolar spaces of the lungs. This object can be achieved in one of two ways.

In the original types of apparatus the outside air was breathed from a bag to which oxygen gas was added from a cylinder at a fixed rate. The disadvantages of such a method are that much of the oxygen is wasted by being expired from the dead spaces of the lungs into the outside air; that there is an uncomfortable drying of the throat; and that moisture and heat are lost from the body in the breath. That the apparatus is wasteful of oxygen can be seen from the following: In order to put up the partial pressure of oxygen in the air at 30,000 feet from 53 mm. of mercury to 110 mm. it can be calculated that oxygen must be supplied at the rate of 9 litres a minute. Now a partial pressure of 110 mm. of mercury is equivalent to an altitude of about 12,000 feet. So in order to bring a man down to this level it would be necessary to supply him with oxygen at this rate. But the body only uses oxygen at the rate of 0·5 a litre per minute at rest and 2 litres per minute (perhaps a little more during severe exercise) during exercise.

An apparatus of this type was taken out this year. It contained two cylinders of "vibrax" steel, each containing 750 litres of oxygen, and the reduction valve was set to deliver 6 litres a minute, though it was capable of adjustment to deliver any other quantity. With such an apparatus the supply then was 1500 litres, and this delivered at a rate of 6 litres a minute would last for just over four hours. Its weight was approximately 30 lb.

In another type of apparatus, instead of air being breathed to which oxygen is added, oxygen only is breathed and the carbon dioxide in the expired breath is absorbed by passing it through a canister containing soda-lime. The breathing circuit is completely enclosed, so that nothing is exhaled into the outside atmosphere. Such an apparatus is similar to that used in rescue work down coal mines and in submarine-escaping apparatus. Its advantages would seem to be that no oxygen is wasted, that heat and moisture are not lost by breathing into the external atmosphere, and that the pressure of oxygen breathed is the same as that of the external atmosphere (*i.e.* approximately 250 mm. of mercury at 30,000 feet), a pressure which is well above the partial pressure of oxygen in the atmosphere at sea-level.

The apparatus therefore should theoretically bring the climber at 30,000 feet down to sea-level conditions.

Such an apparatus was designed and made for us to use on the mountain this year by Siebe Gorman, the well-known firm of submarine engineers. Two sizes of this apparatus were taken. The smaller of the two weighed 25 lb. and carried a cylinder made of vibrax steel of 500 litres capacity. If oxygen was being used by the body at the rate of approximately 2 litres a minute, as it might be during muscular exercise, this supply would last just over four hours. The larger apparatus weighed 35 lb., carried a cylinder of 750 litres capacity, and on the same basis would provide oxygen for a period of six hours. The reduction valve in this breathing gear was set to deliver half a litre a minute, or the amount of oxygen required by the body when at rest; but by means of an automatic valve a greater supply could be released from the cylinder as required during exercise.

The re-breathing apparatus has been criticized on the following grounds: that there is no advantage in bringing the climber down to sea-level conditions, nay, such a change may even do harm; that soda-lime absorbs moisture, so that there is a loss of fluids from the body through the breath; and that nobody would tolerate having a mask over their face at 28,000 feet. In answer to such criticisms I would first of all point out that the most important means of acclimatization in the body is the increase of the red cells and haemoglobin in the circulation, and in the acclimatized person, even on coming down to sea-level quickly, it is a matter of weeks and not days before his blood count begins to fall. If this then is the case it seems unlikely that, by breathing oxygen at the normal pressure for a few hours on end, his acclimatization would be seriously affected. I can see no reason why he should be any the worse after wearing the apparatus, except possibly subjectively and by contrast. Then with regard to the moisture which might be absorbed by the soda-lime, it must be remembered that the patent absorbing materials such as "protosorb" (which was used in this apparatus) are frequently used nowadays in oxygen tents, and for this reason are designed to be practically non-hygroscopic. And lastly, as far as the intolerance to a mask over the face is concerned, the reply is: that with the proper oxygen supply given by such an apparatus the climber would not be at 28,000 feet but at sea-level, and that we found that after a very short time with the apparatus we were perfectly well able to tolerate it. Furthermore it may even have an advantage in that it protects the face from the wind. This year the all-enclosed breathing apparatus was tested both at home in the low-pressure chamber and in Tibet on the mountain. The trials at home were not as thorough as was desirable on account of the limited time at our disposal, and those on the mountain were not made at a sufficiently high altitude to warrant any important conclusions being drawn from them. But this much should be stated, that it was used once on the North Col slopes and resulted in a complete disappearance

of the usual muscular fatigue and lassitude which are usually experienced at such an altitude. Furthermore it was worn by several of us to make ascents of over an hour's duration above base camp, and we none of us suffered any ill effects when it was taken off at the end of the trial. And at Tangu, before any one was properly acclimatized, I used it to climb for at least 1000 feet up the hillside behind the bungalow, and yet with 35 lb. on my back I was able to climb much more rapidly than two of my companions who were going without it. Because of these remarks I do not wish it to be thought that I advocate this as the ideal apparatus, though it does seem to me to offer advantages over anything so far produced. If one has got to carry 30 lb. on one's back up the last 1000 feet, why not carry an apparatus which is going to produce maximal efficiency? But must such an apparatus weigh 30 lb.? I think that, given more time, the weight as it stands at present could be reduced considerably without changing the principles on which it works.

The final question which arises is how should the apparatus be used on the mountain? Personally I think that to try and make the ascent with it from below Camp V is impractical; I would favour its use on the last lap only. It has been suggested that oxygen might be used in camp and at night only, in order to do away with deterioration. In principle this sounds all right, but I do not think that in practice one could tolerate sleeping in it. Furthermore, if one really believes, as some of us who consider the matter from the physiological as well as the mountaineering aspect do believe, that it is impossible for a man to reach 29,000 feet without artificial aid, then such a method of administration achieves nothing towards the attainment of the summit.

A point which requires consideration is whether a six hours' supply will be sufficient to carry a climber to the summit and down again from the highest camp. Shipton has estimated that without oxygen the last 1000 feet will take about sixteen hours. Now even with 30 lb. on one's back it should be possible to climb at the rate of 500 feet an hour over quite difficult ground when at moderate altitudes. We know that this can be done in the Alps, and in the Himalayas I have climbed up difficult rocks at 21,000 feet with a 20-lb. rucksack on my back. If we can perfect an oxygen apparatus, then, which will bring the climber down to sea-level when on Everest, even though it does weigh 30 lb. and has only a six hours' supply, he should be able to get up and down again within this time, always provided that the rock climbing above the couloir is not supremely difficult, and that the first part of the route has been properly explored by a preliminary reconnaissance party, perhaps equipped with oxygen also, so that no time is wasted in route finding. But in any oxygen attempt two things must be borne in mind: that the climber must turn back in time to allow enough oxygen for the descent to the highest point he has been able to reach without it, and that twice as much oxygen is used during climbing as when descending, so that the cylinder should be one-third full when he starts to come down.

APPENDIX IX: COLLECTING

Dr. Noel Humphreys

When we left Sikkim on March 19 it was early spring. Willow, daphne, magnolia, primula, and other plants were already in flower. Reaching the tableland of Tibet however we dropped back into winter and with the exception of one species of very small primula we were not to see another flower until a month later. Tibet was frost-bound and wind-swept; honey-coloured plains with distant indigo hills, steely-blue sky and curiously opalescent atmosphere. Not

a blade of green vegetation was to be seen. On April 17, marching to Kyishong, we saw a butterfly, but we saw no more until May 20 on our return from Camp III to Camp I. By this date the vegetation in the neighbourhood of the camp was green, but as yet no flowers were out. On May 25 the first flower was seen, a saxifrage, and two days later a primula was found in flower. From then onwards most days, when the ground was free from snow, yielded a new flower. Insects and spiders became common, and during the few days before we returned to Camp III we took the opportunity to make such entomological and botanical collections as were possible.

Our next opportunity of collecting was at Lake Camp by the West Rongbuk glacier, which we reached on June 8. This was at an enchanting spot with level green turf, a lake and a winding stream. The turf was, as far as we know, an isolated patch; we had seen no other turf above Chödzong. It was at Lake Camp that the lark's nest was discovered, perhaps the highest nest that has ever been found. Here we were able to make a small collection of plants and insects, though there as yet few flowers were out. A small meconopsis was much in evidence but was nowhere more than in bud. It was at this camp that we started plants growing in boxes. These had to be roped for lifting and for transport as porter-loads and, later, by pack animals.

Once the attempt on Everest was abandoned it was decided that the whole expedition should return to Sikkim as quickly as possible so as to save the expense of a prolonged stay in Tibet. We returned therefore by double marches, travelling up to 25 miles with an ascent of 4000 feet in a day's journey. Collecting was difficult on these journeys as the baggage often arrived after dark, and even then there was delay before tents could be erected. In the evening there was almost invariably a strong wind which made it impossible to press plants or write labels in the open, and in the only tent available there was not room to kneel upright. A constant source of worry was the boxes of growing plants. These were often kicked off the pack animals or crushed, or the contents of the boxes shaken loose. Such boxes had to be re-planted next morning during the short time while it was light before the pack animals started off. Even when Sikkim was reached the plants needed constant care until they were delivered to the Royal Botanic Garden at Edinburgh.

Seeds were collected whenever possible, but these were even scarcer than flowers. Among the few we found were the previous year's seeds still clinging to a clematis which appeared to be the only species of climbing plant in the part of Tibet that we went through. This plant we afterwards saw in flower and there were three forms, apparently co-specific, with flowers nearly black, yellow, and bronze. One of the first shrubs we encountered on our way back was a rose with sweetly scented cream-coloured flowers, and lower down we found the plant in fruit and were able to collect seeds.

All too soon we reached Sikkim and our collecting stopped. We had been racing home just as the Tibetan flora was coming into flower, and it was tantalising to leave behind us most intriguing plants which some of us would never see except in bud.

DISCUSSION

Before the paper at the Afternoon Meeting the PRESIDENT (Professor HENRY BALFOUR) said: It is an extreme privilege on the first occasion on which I take the chair at a meeting of this Society to find that the lecture we are about to hear is of such importance and great general interest. I feel tempted to refer to the high honour which has been conferred upon me, but as chairman of the meeting it

is my duty to further the proceedings and not to delay them. So without even the usual preamble I will proceed to the business in hand.

Mr. Hugh Ruttledge is already well known to the Society not only for the work that he has done in the Himalaya and on Mount Everest, but also as one of the Society's Gold Medallists. That in itself is sufficient introduction.

Without delaying proceedings further I will ask Mr. Ruttledge to give his account of the latest assault upon Mount Everest.

Mr. Ruttledge then read the paper printed above, and a discussion followed.

The PRESIDENT: Mr. Smythe has a few supplementary remarks he would like to make with regard to the photography and the snow conditions, of which he made a special study.

Mr. F. S. SMYTHE: I would like to preface my remarks by acknowledging the expedition's debt of gratitude to Messrs. Kodak, who supplied the film you have seen and the apparatus with which it was taken; also the still films which we used on the expedition. The film was super-speed panchromatic, and you have just seen the Kodachrome film. It is necessary to give the latter about four times more exposure than the ordinary super-speed panchromatic film.

(Mr. Smythe then dealt briefly with snow conditions on the North Col. See Appendix V.)

Mr. W. R. SMIJTH-WINDHAM: Having been on two expeditions, that of 1933 and this year's, both led by Mr. Hugh Ruttledge, I want to start by saying how extremely fortunate we were as a party to have him as a leader. I am sure that the Mount Everest Committee will have an exceedingly difficult task to find another of his calibre to lead a future expedition, but I wish them luck.

(Mr. Smijth-Windham then gave an account of the problems connected with wireless arrangements on the expedition, treated in Appendix III.)

The PRESIDENT: I would have liked very much to invite onto the platform all the members of the expedition, not only for the sake of hearing what they can tell us in regard to details, but also for the sake of seeing them as they really are. You have seen them on the film and in the photographs, and three of them have revealed themselves on the platform. As far as I can make out there is a good deal of difference between the two versions. I must however bring this interesting meeting to a close. I should however like to say that, as a result of the account to which we have listened, it appears clear that for the future we can rely perfectly upon physique, endurance, pluck, mechanism, and all those other necessaries without which success cannot be achieved. There is one great problem however still to be solved, which I suppose will remain the principal crux, that is weather-conditions. But if the last expedition, like the previous expeditions, has ended in disappointment to those who have taken part in it and who have been robbed of success, at least one can say very definitely that Mr. Ruttledge and his colleagues have added several important rungs to the ladder which eventually will lead to the top. On this account, for the work which they have done with so much enterprise, pluck, and endurance, I am sure you will like to express your thanks to them; and to Mr. Ruttledge in particular, for having given us this lucid, straightforward account of the events of the expedition.

Before the paper at the Evening Meeting, the PRESIDENT (Professor HENRY BALFOUR) said: We have an extremely interesting evening in front of us, and I am not going to delay the proceedings by making any preliminary remarks. It is of course quite unnecessary for me to introduce our lecturer. Mr. Ruttledge is thoroughly well known to all of you by name and to a great many of you personally. As a Gold Medallist of the Society he is guaranteed. I call upon

him to give his account of the last expedition which has aimed at the conquest of Mount Everest.

Mr. Ruttledge then read the paper printed above, and a discussion followed.

The PRESIDENT: I ask Mr. Smythe to continue his remarks and particularly to tell us something more with regard to snow conditions.

Mr. F. S. SMYTHE said: I should like, first of all, to say how great was the privilege of again serving under Mr. Ruttledge. You have heard a great deal about our unworthy selves, but he has given very little idea about himself. I do not think that any leader ever had a more unpleasant task than Mr. Ruttledge this year, because he had to exercise that judgment and discretion in the face of adverse circumstances which is so difficult when conditions seem possible and yet are unjustifiable. That always seems to me to be the test of leadership, and this is the second expedition that Mr. Ruttledge has brought back to England alive.

(Mr. Smythe then resumed his account of his observations of snow conditions on the North Col, printed as Appendix V.)

The PRESIDENT: You would, I think, like to hear something with regard to the medical side of the expedition, so I hope that Dr. Noel Humphreys and Dr. Warren, the medical officers with the expedition, will add a word or two.

Dr. NOEL HUMPHREYS described the precautions taken to secure the health of the expedition and their success (see Appendix VI). He continued: We were ready for any emergency, but nothing happened, or almost nothing. This may of course have been partly due to all the precautions taken. We were however very anxious to show our skill, and about the middle of the expedition at Camp I we thought we had an opportunity. One of the porters was found groaning and curled up round a stone. He could not be straightened out because he was in such pain. He was examined carefully by the medical staff, who thought it a very serious case. We called for volunteers to go up to Camp II to bring down surgical appliances. The man passed into a state of coma. The surgical equipment came down in the middle of the night, but it was then too dark to operate, At the first grey light of dawn I went to see the patient. He was not there. Fearing that we might stop him, he had got up early to carry a load to Camp II, and was already on his way.

Dr. C. B. WARREN: As far as the physiological side of the expedition is concerned I might mention that the only word that was taboo from the start was "deterioration." We have heard a great deal about it in the past, and I think that what was said after the 1933 Expedition was probably true: up to altitudes of 21,000 feet one can remain comparatively well, eat well and sleep well, and not lose weight. Once one gets above 21,000 feet one begins to go downhill gradually, to lose weight and appetite, besides other minor happenings.

(Dr. Warren then discussed the physiological side of the expedition and the problems involved in the use of oxygen, as set out in Appendices VII and VIII.)

The PRESIDENT: I hope Sir Percy Cox will add a few words. He is Chairman of the Mount Everest Committee.

Sir PERCY COX: I feel great compunction, after we have listened with the liveliest interest to the leader's account of the expedition, to come on to the platform and turn to the dry bones of Committee business.

As many of you know, from the birth of the Everest ambition there has existed what is known as the "Mount Everest Committee," composed of representatives of the Alpine Club, the Royal Geographical Society, and, latterly, of the Himalayan Club. The functions of this Committee have been to seek the necessary funds for the expedition in view and to supervise the business affairs connected

with the organization of it. In so doing they clearly take a good deal of responsibility. The Committee, in name, remains permanently in being: that is to say, it is a standing committee, and when, after an interval, which may be short or long, fresh permission is received for another expedition to enter Tibet, the personnel of the Committee is reconstructed and it starts functioning again. I was nominated to the present Committee as a representative of the Royal Geographical Society, and, I suppose in deference to my grey hairs, I was asked to take the Chair; so that I have been closely associated with the affairs of the present expedition from the start.

The first duty of the Committee, apart from getting to work to collect funds—and a large sum is needed for a properly equipped expedition—is to choose a leader and allow him to choose his team, subject of course to the concurrence of the Committee. On this occasion the Committee invited Mr. Ruttledge to lead again, and as leader he chose his team. I am bound to say that I do not think we could possibly have had a better or more satisfactory leader or a finer team of young climbers. Unfortunately, as you have heard, we had no luck with the weather and again we did not succeed.

When the business of this expedition is wound up the present members of the Committee will, as I have explained, disperse, and the Committee will be reconstituted by the bodies represented, as soon as permission to go to Tibet is again granted.

We are of course always in a state of chronic hope of receiving such permission, but it may be a year or it may be ten years before it comes; so that anything I say now does not commit the next Committee in any way.

I would like here to pay most grateful tribute to all the Services or Departments of State who have given us most cordial co-operation. The Royal Air Force gave us the benefit of their exacting medical examination of all the candidates, and also allowed us to send the members of the team to Farnborough to be put through their high-altitude tests. The War Office were extraordinarily helpful in making it practicable for officers to obtain leave to join the expedition, and even when possible to spare them on duty.

The India Office, the Viceroy, and the Government of India have all vouchsafed us the most sympathetic co-operation all through, and I cannot be too expressive of the profound gratitude which, as a Committee, we feel towards the Government Departments for the help we have received from them.

As regards Mr. Ruttledge, the despatches which he sent home periodically during the course of the expedition were excellent and his judgment as leader, in the very difficult circumstance of failure and not of success, has been thoroughly sound throughout, and the Committee are most grateful to him for the way in which he led the expedition.

Let me now congratulate him on returning with his team complete and all well, and may I assure him that I, at any rate, feel honoured to have been associated, as Chairman of the Committee, with the expedition of this fine team. Nothing more could have been done than was done to achieve success, and it was solely the bad luck in the weather which denied it to them.

But I devoutly hope that I may live to see the mountain conquered, and there is another man here to-night, Sir Francis Younghusband, who, I am confident, feels the same.

The PRESIDENT: It is now, I regret, necessary for me to bring these proceedings to a close. We have had a most interesting evening and have listened to an account of a very strenuous endeavour to effect the conquest of Mount Everest, which has been an objective for so long. Again that attempt has not met with the success which it deserves, but if those who took part in the adventure feel

disappointed at the result, they can at any rate feel proud of having added considerably to the knowledge and experience which will eventually bring success. The experimental work has continued. We know more about the human physiological reactions. We know more about the necessary instruments which ought to be carried, and more about the snow conditions. Very probably the only factor which prevented success was the weather, which has been behaving throughout like a grim and vigilant duenna keeping watch and ward over her protégée, the virgin peak of Everest. The main problem in the future will be how to circumvent, or perhaps catch napping, that stern duenna.

Amongst the factors which will always be instrumental in bringing about final success are those absent heroes, the Sherpa porters. It is not possible to speak too highly of them. In asking you to show your appreciation of our lecturer and of his companions on this expedition, I would ask you to put in an extra round of applause for those porters.

HADHRAMAUT: A JOURNEY TO THE SEI'AR COUNTRY AND THROUGH THE WADI MASEILA

W. H. INGRAMS, O.B.E.

BETWEEN 1921 and 1923, when I was serving in the island of Pemba in the Zanzibar Protectorate, I made friends with a number of Shihiris, as the inhabitants of the Hadhramaut are generally called in Zanzibar, and took into my service in a domestic capacity a small boy called Karama who had recently come from Tarim, where he had a widowed mother, to seek his fortune in the "Green Island" of the Arabs. It was chiefly from Karama that I began to learn Arabic, and from his conversations that I learned of Shibam, Seiyun, and Tarim in the Wadi Hadhramaut. My interests in Arabia were at that time mostly centred in 'Oman whence came the ruling Arabs of Zanzibar; the only references I possessed to the Hadhramaut were in Hogarth's 'Penetration of Arabia.' It was thus Karama and Hogarth between them who aroused in me the desire to visit the country and explore the wadi of which Hogarth wrote, "Interest in Hadhramaut should not be suffered to decline yet. About half the trunk wady still remains unexplored and the least-known part is that upon which border the ancient Mahra tribes."

I hoped to visit the country in 1924, and to that end collected letters of introduction from prominent Hadhramaut Arabs in Zanzibar, amongst whom was an old friend, a native of Shibam, the late Seiyid Ahmed bin Abi Bekr bin Sumeit al 'Alawi, leader of the Sunni Qadhis, who had a reputation as a jurist which extended as far as Constantinople. Circumstances however did not permit of the journey, and later my letters of introduction were eaten by white ants in Mauritius. A move to Mauritius moreover seemed to place the Hadhramaut even farther away, though my interest in it never declined and I obtained and read there Van der Meulen's book. An unexpected move to Aden brought a visit to the Hadhramaut within the realm of practical politics, and nothing could have pleased me better when, after a few months, Sir Bernard Reilly, the Resident, told me that he proposed to send me there in the autumn of 1934. Sir Bernard himself had visited the country by air in 1933, being the first Resident of Aden to see the Hadhramaut. What he had seen determined him that when staff arrangements permitted he would send an officer to make a fuller survey of the country than had yet been possible. The principal exploratory object of my journey was therefore to inquire into the social, economic, and political condition of the country, and to make contacts with its rulers and people.

It is not generally known that the Hadhramaut is a part of the Aden Protectorate. Speaking politically, we include in the term Hadhramaut the territories of the Qu'aiti and Kathiri Sultans. In some ways the Qu'aiti Sultan is perhaps the most important ruler of the Protectorate, for he controls or has direct influence over a larger population than any other chief, and, except for the Mahra Sultan of Qishn and Soqotra, whose nominal kingdom extends over a much wider area, he rules the largest tract of territory in the Protectorate. The 'Abdali Sultan of Lahej and the Qu'aiti Sultan of Mukalla, who are the only two Highnesses in the Protectorate, are by their geographical

positions the natural leaders of the western and eastern parts of the Protectorate, but while the Sultan of Lahej, who is the direct ruler of only a comparatively small state, has by virtue of his proximity to Aden and by his assertion of the hegemony over the western portion established his position as the premier chief of the Protectorate, the Sultan of Mukalla has not yet secured recognition by the Wahidi Sultans or by the Mahra Sultan as their natural leader.

There is an extraordinary complexity of social and governmental organization in the Hadhramaut. The country is in a transition period between the disappearance or modification of the earlier social organization, which has

itself evolved with the centuries, and the development of Government more or less on western lines. To understand the complexity of the structure, something must be said of the seven distinct classes of society in the Hadhramaut. They are not all represented in every part of the country, and the order in which I propose to deal with them is partly historical and partly represents the order of their importance.

The Seiyids of the Hadhramaut derive their descent from an ancestor who migrated to the country from 'Iraq over a thousand years ago. Until the last few years the Seiyids occupied universally over the Hadhramaut very much the position of the church in the Middle Ages in Europe, forming a theocracy with which the temporal rulers of the country interfered very little. On the whole their influence was generally on the side of law and order and they wielded great power. Some years ago however a movement, due to liberal

tendencies arising from contact with western influence, started among the Hadhrami immigrants in the East Indies to restrict the power of the Seiyids, and although no actual organizations were set up in the Hadhramaut the spirit of the movement made considerable headway.

In Qu'aiti territory the influence of the Seiyids has officially gone. Unofficially they still play a necessary and indeed essential part in those districts not yet directly under Government control. In Kathiri territory they have more influence, but the leading families have allied themselves with the temporal rulers and are amongst the keenest advocates of modern methods in the country. Many of the families of the Seiyids have hereditary chiefs bearing the title of Mansab, who are also recognized as spiritual leaders by various tribes.

Before the arrival and rise to influence of the Seiyids, the Sheikhs[1] were the principal ecclesiastical influence in the country, and probably took the place of an earlier hierarchy formed by the priesthood of the old religion. Though they definitely take precedence after the Seiyids they resemble them in that they exercise much the same privileges. Like them, they are a very much respected class, are better educated than the tribesmen, and do not as a rule bear arms. The Yafais in the Hadhramaut were brought as mercenaries in the Middle Ages. They are now the actual rulers of Qu'aiti territory. The present dynasty springs from the Qu'aiti section of the Mausata clan of Upper Yafa' in the west of the Protectorate. The tribesmen form the bulk of the population. They are either settled or nomads (but not tent dwellers), and the latter are of considerable economic importance in the life of the country as the carrying trade is in their hands. They are extremely conservative and have a reputation for maintaining their agreements with their neighbours. The tribes are sub-divided into *Beits* or houses, and *Fara's*. A confederation of tribes with a single leader is known as a *Zei*. There are only three of these, the Seibani, the Nuwah, and the Hamumi.

The townsmen of the Hadhramaut are derived principally from eighty families who migrated from 'Iraq with the ancestor of the Seiyids. Certain families of them possess recognized authority. They are divided into merchants, artificers, labourers, and servants, none of whom bear arms. The economic life of the country depends to a large extent on them. They are the principal taxpayers, and form the chief link with the outside world. The leading merchants to some extent govern the affairs of their towns and have developed more than a germ of municipal organization.

The presence of the slaves dates from a remote period. They are of African origin and some of them rise to high positions.

The Subians are the lowest class of the population and are said to be descended from early Abyssinian invaders. Some are agricultural labourers and others hewers of wood and drawers of water. Neither slaves nor Subians can be the subjects of blood feuds.

The interplay of some of the classes one on another has in the Hadhramaut,

[1] The term Sheikh is here used in a special sense applying to all members of Sheikh tribes and not in its general sense of the head of a tribe. The title, of course, has an even wider currency than this, for it often has no more meaning than the English "Esquire" has in ordinary use to-day.

as it has in other countries, given rise to abuses which, as the life and thought of the Middle Ages is influenced by the increasing current of modern ideas and development, have stimulated from within a desire to shake off the shackles of the old order. To some extent the old order is adapting itself to modern conditions, though there are still, for instance, diehard conservatives among the Seiyids, who, fearful for the disappearance of their power and prestige, cling to a bigotry and fanaticism which refuse recognition to any innovations. A strong Government can no doubt in time cope with the reactionaries among this class, but it has greater difficulties in contending with unruly elements among the tribesmen.

While many of the tribesmen have, by emigration, secured sufficient wealth to acquire immovable property, have settled and allied themselves with the townsmen and property-owning Seiyids in a movement to promote peace and safety, some of the "have-nots," preferring their nomadic existence and clinging to ancestral habits of raiding, take by force what they cannot buy, or live on blackmail paid by the harassed landed classes to secure immunity. Even the honest carrier is apt to show a more than passive resistance when he fears that the increasing motor transport will deprive himself and his camel of their daily bread. The slaves, too, are showing signs of unrest.

The age-long seclusion of the Hadhramaut has now gone, and while the Hadhramis have been historically wanderers, the last fifty years has shown an ever-increasing flood of emigration. I estimate the resident population of the country at about 260,000. There are at least 100,000 Hadhramis living abroad. The estimated amount of money remitted into the country is £630,000 annually, and returning emigrants bring with them not only wealth but ideas of Government gained in their sojourn in more advanced countries.

It is interesting to note that to a great extent each colony abroad is connected with a particular place or places in the Hadhramaut. The largest colony of Hadhramis abroad is in the Netherlands East Indies where there are about 70,000, mostly from the Al Kathir. They are principally traders in batiks and sarongs. In Singapore the community, which originates mainly from Tarim and Seiyun, is small but extremely wealthy. It occupies itself mostly with house property. In Kenya, Tanganyika, and Zanzibar there are large numbers of Hadhramis from Shihr, the Tamimi tribe, and the tribes of Hajr, but the standard of wealth is much lower than in the East Indies. Some are small traders, but most are engaged in manual occupations. In the Sudan, Egypt, Saudi-Arabia, and Abyssinia, there are also many Hadhramis who come for the most part from the Wadi Du'an. A number of them are important merchants of a rather more conservative type than those in the East Indies, but many engage in petty trade and other occupations.

Over this curious diversity of conditions existing in the Hadhramaut is superimposed a Government which attempts a compromise between the methods of the West, probably borrowed mostly from Indian contacts, and indigenous institutions. The Qu'aiti Sultan of Mukalla is recognized as the ruler of the whole country, but that part of it defined in the Qu'aiti-Kathiri agreement of 1918 as Kathiri is autonomous in its domestic affairs. Neither the Qu'aiti nor the Kathiri Sultans however have entire control in their territories, but in those districts or towns where the rule is absolute the central

Government appoints Governors who take full responsibility for the affairs of those places. There are towns and villages which are autonomous and they are governed by particular tribes or families. For his relations with the tribes in the country the Qu'aiti Sultan has two types of written agreements, one by which a tribe undertakes to respond to his call at any time, and the other an engagement of friendship with an undertaking to co-operate in matters of mutual interest. I will refer to these when necessary as A and B agreements respectively. No attempt is made to interfere with tribal usage, which however does not run in the Qu'aiti towns or within the area round them demarcated by white pillars. Routes between Qu'aiti towns are sacrosanct and carriers may not be made the targets of blood feuds when travelling over them. When there is any doubt as to the loyalty of a particular tribe the Qu'aiti Government takes hostages who may be changed every month. The Qu'aiti Sultan is enabled to enforce his control by the fact that he holds the ports and important markets. The seat of Government is at Mukalla, where the Sultan, his Wazir, and high officials reside. The Qu'aiti dominions are divided into five provinces, Shihr, Mukalla, Du'an, Hajr, and Shibam, each under a *Muqaddam* or Governor. The Wazir is *ex officio* Governor of Mukalla province.

We had arrived at Mukalla from Aden on the morning of October 31 after a journey of just over thirty hours. There is no necessity to describe the town, which is well known, but it appeared to me as a small edition of Zanzibar. In contrast the tall white houses and graceful minarets have an imposing background of mountains lacking in the former city. The population is about 15,000, and the town appears to be growing, as building operations are going on whenever I visit it.

During our stay in Mukalla much of my time was taken up with inspection of the different activities of Government. The army, the principal support of the authority of Government, consists of regulars and irregulars. The former included four hundred Yafais who are paid nine dollars a month, and two hundred and fifty slaves, who cost more as they and their families are entirely kept and clothed and receive one to three dollars a month as pocket money. The slave boys are organized in a cadet corps, do physical drill regularly, and are carefully looked after. They gave us a very creditable display at a "review" at the palace and looked well in their khaki uniforms. The regulars have but one set of uniform, which is only used on state occasions. When we were there the sentries all wore uniform in honour of our visit, but the drills were carried out in anything but "plain" clothes, for the variety of costume made a wonderful display of colour. The higher ranks of the regulars include one Subedar and four Jemadars. There are about twelve hundred paid irregulars officered by eleven *Muqaddams*, each with a *Mu'awin*. The police are divided into uniformed and slave branches. The uniformed police wear blue, and the slave police only, for obvious reasons, are employed in dealing with disorderly tribesmen in the town.

The Qu'aiti Government maintains three schools (one English) and a dispensary run by a qualified Hindu doctor. The water supply is brought by aqueduct from Baqrein and is piped to public fountains. There is a good vegetable market and others, it is said, are to be built. The town has several minor industries, of which the principal is fish drying. West of the town fish

manure and fish fodder are prepared, and outside to the east fish is cured for human consumption. This industry was removed from the interior of the town by the late Sultan, but the pervading aroma of Mukalla is still dried fish. Other small industries are the crushing of simsim for oil and cake, lime burning—the best quality lime used in Aden comes from Mukalla—and tanning.

We spent a day in the walled town of Gheil Ba Wazir which is the seat of the Government-directed Hamumi tobacco industry. This tobacco is one of the best-known brands of hookah tobacco in the Near East. We visited the extensive nurseries and gardens. The tobacco is sun dried and partly fermented, and barns are not used. Mukalla is the principal port of entry and the bulk of the imports are distributed from it to the interior. Over fifty thousand camels annually leave the camel park, called Therb, outside the western walls, serving routes to Du'an, Shibam, and Hajr provinces. Each route is recognized as worked only by a particular tribe, and no tribe would dream of using another's route.

Travel in the Hadhramaut is very easy, for the main routes are so well organized that there is little more difficulty in planning a journey through one of the brokers of the Badawin than there is in planning a journey through Europe with the aid of Thomas Cook's. As we were to travel *via* the wadi Du'an our caravan belonged to the Seiban tribe and were members of the Rashidi clan. Arrangements were made for us by their broker, one Ba Ubeid, a cheerful smiling person whom we liked very much.

Although the fares are not printed in a local Bradshaw they are established and well known, but just because they are not printed it may be of interest to give them here. The 1934 fares to Du'an were as follows:

1. By donkey, *Wata* and '*Aser*, that is to say, riding over level country and over the rough and hilly places, standard rate, 15 to 16 Maria Theresa dollars whose exchange value depends on the price of silver. If the traveller is under or over normal size he pays less or more according to weight, very much in the same way as one does when travelling by air. The limits each way are from 12 to 20 dollars.

2. By donkey, *Wata*, *i.e.* riding only over the level country, standard fare, 10 to 11 dollars with limits according to weight of from 8 to 15 dollars. Each passenger is allowed free transport of up to three *frasilas* of food. One *frasila* equals 20 lbs.

The camel fares are, *Wata* and '*Aser*, 10 dollars, *Wata*, 5 dollars. In the same way there is free allowance of up to three *frasilas* of food but no allowance for weight.

From these figures it will be seen that the aristocratic means of transport on the Du'an road is the donkey.

The luggage or freight rates are, by camel, 10 dollars for a *bahar* of 20 *frasilas*, and by donkey, $1\frac{1}{4}$ dollars a *frasila*. In addition rations have to be provided for the donkey men and camel men at the rate of one man to one animal for donkeys, and one man to up to three animals for camels. For donkey men the rations cost from $\frac{1}{2}$ to $1\frac{1}{2}$ dollars a head, according to whether they eat with the traveller or not. The rations for camel men cost 2 dollars a head, as they take eight days over the journey instead of six. The rations

are flour, oil and ghee, rice, dried fish, dates, spices and onions, coffee and dry ginger. Rations are only paid for if the caravan is accompanied by passengers.

The traveller who wants luxury also engages a couple of *ma'ras* or porters who proceed on foot the whole way carrying, like a Chinaman or a milkman, a pole across their shoulders from which is suspended a basket at each end containing light breakables. These men cost about twelve rupees each for the journey. They keep with the traveller all the way, provide in theory liquid refreshment when required, gather the wood for fires at nights and generally perform such domestic duties as may be asked of them.

The caravan roads of the Hadhramaut are also remarkably well organized, for apart from the many natural springs and water-holes the more important routes are well provided with *siqayas*, or public fountains, near villages, and *qarifs* or *naqbas*, artificial pools and cisterns for rain water, in the desert places. There are also *muraba'as*, rest-houses, at intervals approximately of a few hours' journey over the principal routes crossing barren country. *Siqayas* are usually endowed, and it is the duty of some one in the village near which they stand to keep them filled with water for the benefit of thirsty travellers. *Muraba'as* are built mostly by wealthy merchants to afford the traveller shelter from the sun during his midday halt and rest and security at night. There are also in many places graves of saints at which travellers may leave their property under the protection of the saint until they wish to reclaim it. The system works very much like railway left-luggage offices, but there are no fees to pay.

The camels of the Hadhramaut are generally recognized as being of poor quality, and the country produces no surplus. The Qu'aiti Government estimates the total number in the country at 20,000. Where water and fodder permit the more favoured method of transport is by donkey, and practically speaking there are no *dheluls*, or riding camels, available. Riding saddles, too, are not as a rule obtainable, and the traveller usually sits on top of his baggage. For our ride down the Wadi Maseila we were provided with saddles having a pommel in front and one behind. They differed from those in use in the western part of the Protectorate which rise fore and aft to a broad buttress. Personally I found the Hadhramaut pattern more restful.

The Mahra country, of course, is historically famous for its camels which are mentioned by Masudi. Farther west, particularly in the 'Aulaqi and Fadhli countries, there are also good and fast camels. A good camel imported into the Hadhramaut fetches a high price and quickly gains a local reputation. The Hadhramaut is not a country in which to buy camels for a journey. The country is so varied with its wadis, steppes, and sand, that it is far better to hire camels from each centre which will be used to the route to be followed, and very much less expensive to follow the custom of the country by making use of the organized transport facilities.

On the morning of November 6, the day of our departure, we found that we were required to go through a heavy engagement with the Court Photographer, and when this ordeal was over we said goodbye to the Regent, Sultan Salim bin Ahmed, and started off by car to Tila as Sufla where we found our Badawin and our transport. Our party had been increased by Salih 'Ali al Khulaqi, a *Muqaddam* of Irregulars, and Salim bin Miftah, a

slave sergeant of artillery. Our caravan consisted of four camels, one mule, and eleven donkeys.

We were accompanied throughout our journey by an Aden friend, Khan Sahib Hasan Muhammad Salih Ja'fer, and by two servants, Zaidi bin Bukheti, an Mtumbatu of Zanzibar, who has been in my service for sixteen years, and Ganess Chamari, an Indian of Mauritius who has cooked our food for the last five. It was extraordinarily gallant of Hasan Muhammad to come with us. He is nearly sixty years of age, and a journey through the Hadhramaut seemed much more of an adventure to him than it did to us.

I propose in this paper to skim rapidly over our journey as far as Shibam and our sojourn in the towns of the wadi, for these have been thoroughly described by others who preceded us, and, much better than I could do, by Miss Stark, who followed us.

After leaving Tila we travelled up through wadis, and our third day brought us to the ribbon-built village of Hisi, consisting of low huts huddled precariously on the edge of a cliff overshadowed by the heights of Hadhramaut's highest mountain, the Kor Seiban. At Hisi we left the wadis and our afternoon's journey took us on to the uplands of the plateau or *jol*. It was a beautiful afternoon and the eye, not yet used to the monotony of the far-spreading and almost barren plateaus, rejoiced in distant views of mountains and valleys. The track we were following was polished white by the footsteps of men and beasts, and at places on the alabaster-like rock we saw carved in Himyaritic and Arabic the names of passing travellers. Even the Arabic ones, some of which were dated, went back a long time, but the presence of the Himyaritic names reminded us that the road was thousands of years old and we could be sure that the scenes we saw had remained unchanged during all these centuries. Carvers of names often arouse one's wrath, but I think if I had had the necessary instruments I should have been tempted to add an English name to those we saw there.

That night was chilly, for we were nearly 6000 feet up. We started our journey next morning by following a narrow track clinging to the side of a mountain and soon saw below us the grave of the giant Nebi Mola Matar from whom the mountain takes its name. This was the first of the many giants' tombs we saw in the Hadhramaut. High up on the face of the opposite mountain is a weather-worn rock which our Badawin said represented their prophet's camel. The spot is sacred to the Badawin who hold there an annual fair, and I wondered whether the place was not a relic of one of the old sanctuaries of the pre-Islamic nature gods, particularly as the name means rain. To try and make this prophet more orthodox, a somewhat apologetic effort was later taken to identify him with 'Ali, the son-in-law of the Prophet Muhammad. There is also a well-known "left-luggage office" near the grave.

After leaving the Sha'b of Mola Matar we climbed up on to the plateau of Bein al Jibal and were again in open country. At a quarter-past five we reached the edge of the Hasar Johar plateau from which we had a magnificent view. The descent was difficult and it was after dark when we halted at a rest-house near the deserted village of Sarab. The place belonged to the Sumuh tribe with whom our Rashidis were at feud. Our caravan leader, Sa'id, a most delightful person who beguiled us during many of the hours of march with

haunting tunes on his pipe, told me "the inhabitants had left for grazing reasons." There may have been something in this as the place was barren enough, but I suspect they had had other discomforts. The route we had been following is the responsibility of the Governors of Du'an and our Badawin were always saying that they stood no nonsense about raids on it.

Next day we passed several villages. Near one of them a traveller came up to me and asked me to renew his passport. I wonder if anybody has ever had a service like this sought in such circumstances. The country was now utterly monotonous in the sameness of its features, though by no means boring. All the hills that we saw were either pointed and shaped like cones and pyramids, or flat-topped and shaped like inverted pudding bowls or pie dishes. We spent our last night of this part of the journey at Ba Khamis, only a few hours from Du'an. Our two minutes' silence on November 11 was passed on the barren Jol 'Ubeid, and a few minutes later we were met by representatives of the Ba Surra family to which belong the co-Governors of the Du'an province. Shortly afterwards we saw the first of the white pillars marking the area round the capital of Du'an within which the Badawin may not raid.

Just after half-past twelve we had our first glimpse of the stupendous chasm of the Wadi Du'an. The moment when, over the edge of a precipice nearly 1000 feet high, the wadi beneath comes into sight is quite unforgettable. The bed of the wadi is lined by a river of green date palms mingled with the lighter green of *'elb* trees (*Zizyphus Spina-Christi* L.) and cultivation. One does not at first perceive the towns, and then, out of the pale-brown sand-coloured cliffs, there seem to rise up great castles of the same colour.

The province of Du'an includes the towns and villages in the wadi as far as and including Hajarein and the whole of the Wadi Leisar. The area under the influence of Du'an is however much greater. The co-Governors, Muhammad and 'Umar bin Ahmed Ba Surra, are also *Muqaddams* of the important Seibani *Zei*. This tribe has an A agreement with the Qu'aiti and its loyalty is so assured that no hostages are taken from it. It numbers about 3000 armed men and is part nomad, part settled. The Marashida to which our Badawin belonged is all nomad and owns some 1200 camels. The head-quarters of the Amudi, the most important Sheikh tribe in the Hadhramaut, is also in Wadi Du'an. The province is entirely agricultural, but the date palms, though thickly planted, are really valued for sentimental reasons and a single tree may cost anything from 400 to 1000 dollars. Honey is the principal crop and we had a most interesting initiation into the mysteries of bee keeping while we were there; the methods are in essentials those of the West.

The towns in the lower part of the wadi form a retreat to which the rich come and rest from the turmoil of the world. The somewhat "American" air of Tarim is lacking, and the beautiful houses of the rich merchants from the Red Sea are a pure Arab development. In the West these merchants would correspond to the prosperous old men who used to wear mutton-chop whiskers, attended church regularly, and are now, with their old-established houses, unhappily disappearing.

After two pleasant days full of interest in this old-world and Arabian Nights atmosphere spent as guests of the Ba Surras at their castle of Masna'at al 'Aura, we left for Shibam, being hospitably treated at Sif, where we spent

Khoreiba in Wadi Du'an

Qabr Salih

Ruins of Gheibun

our first night, and at Meshhed and Haura, where we spent the second and third. Between Sif and Meshhed we visited Hajarein, which has a beautiful situation on the heights of a wadi island, but which on closer acquaintance is dirty and tumble-down. When we were there the stench was appalling, for a sickness had killed many of their cattle and the carcases had been thrown over the cliffs on which the town stands.

We came to Meshhed in the golden glow of evening. It is a modern town, autonomous, and was founded by the father of the present Mansab, whom we met at Sif, whither he had come to settle a dispute at the neighbouring town of Qeidun. He is a fine old patriarch and rides a horse round the country, wearing a red sash of office, and preceded by a drummer boy on a donkey. As he passes, the workers in the fields down their tools and come up to kiss his hand or seek advice. I think he must inspire affection in all who meet him; he certainly did in us. He offered to come back home to entertain us, but we would not hear of this and his sons deputized well. The eldest Muhammad told us the story of the place. For some two hundred years there had been continuous looting and raids in the valley, and his grandfather built a house there in order to keep the peace, calling it *Meshhed*, or the place of witness. His efforts were successful and so much influence did he wield, for instance among the Sei'ar, that Muhammad told us that any one who took his grandfather's stick could pass anywhere in their country. There are many large tombs in the town, chief of them being the shrine of Seiyid 'Ali bin Hasan al 'Attas, and a fair is held on the 12th Rabi 'al Awal. Of cultivation there is none at all, for the seiyids, and there are no other inhabitants, are supported by others, receiving contributions from very distant places.

We spent a happy day exploring the ruins of Gheibun and collecting flint and obsidian implements, pieces of pottery, and fragments of inscriptions. We had expected to be met by cars, but as they did not arrive we rode on to Haura. We hoped for a quiet night in a pleasant date plantation near the town, but most of the population came out and begged us to sleep in a house which they had made ready for us.

Next morning we rode from Haura out of the Wadi Du'an, or Hajarein, as it is called here, into and across the wide extent of the main Wadi Hadhramaut, reaching the little town of Henin under the northern cliffs. Our arrival here was quite unexpected, and though we were urged to stay we felt we must press on to Shibam. Sheikh Muhammad Sa'id Marta', a retired merchant from Java, gave us welcome refreshment and drove us in his Opel to Hauta, where we were kindly received by Sultan 'Ali bin Salah, the ex-Governor of the Shibam province. After tea with him we drove on to Shibam and were soon installed in a pleasant little villa of East Indian style in the rich man's suburb of Seheil.

I have told of the building of Shibam's "sky scrapers" in the *Journal*, and further description of the town may be waived as it has been much visited, pictured, and described. It is the headquarters of the province and the new Governor, a dear old slave with hennaed beard named Ferai Sa'id, had come the day of our arrival to take up his appointment in succession to Sultan 'Ali, who had left office just over a week before. It was not his first gubernatorial appointment, and it is said that when he was Governor at 'Einat he personally

administered a beating with the flat of his sword to some quarrelsome Seiyids. They protested against this profanation of their sacred persons by a slave, but he replied that it was not a slave who was administering correction to unruly subjects, but the sword of the Qu'aiti Government. In the wadi the province extends west to Husn al 'Abr and eastwards only to a short distance from the town. Those parts of other wadis near this stretch are also included. The most important tribe in the wadi part of the province is the Nahd. The Qu'aiti has an A agreement with one clan and B agreements with two others. They are an uneasy tribe in a sort of chrysalis stage between nomadic and settled habits, and just before our visit Sultan 'Umar had visited them and arranged a series of truces for them.

Shibam is an essential market for the tribes around and they are therefore bound to keep on fairly good terms with the Qu'aiti. The bulk of the trade is from Mukalla, but up to 14,000 camels are estimated to come yearly from the Yemen and the western part of the Protectorate, not more than a thousand come from Sana'. There are three more or less important routes to the Yemen, one of which goes to Nejran. Not only do the Badawin require to purchase their necessities in Shibam, but they also need to sell their scanty products there. Shibam could do, and has done, without even the Yemen trade, for it can well depend on the secure routes to the sea. It is a busy, active place, much more alive than Du'an or Seiyun and Tarim, which are really places of retirement for the rich. The Shibam merchants spend quite bustling lives, breaking off only on holidays or when the *seil* comes down and the whole population closes its doors and troops out to watch the turgid, brown, life-giving water swirling into the date groves.

Of the tribes dependent on Shibam the one that interested me most was the Sei'ar into whose country we were to travel. The tribe numbers about 1700 armed men and has four paramount chiefs, of whom we proposed to visit Tannaf bin Seheil. They are the wolves of South Arabia and a name of terror to their neighbours. They are practically without friends, though the Qu'aiti has a B agreement with them. When I discussed with them their relationships they told me they never had truces for longer than a month between their sections. Those with other tribes—'Awamir, Kathiri, Hamumi, Murra, Rawashid, Manahil and Yam—were for periods up to a year. "We have no permanent friends," they said, "we don't want them." "Except us," said our Harizi *Muqaddam* timidly. "Oh, yes, you," was the reply, "but you are too unimportant to count."

In the wadis and in the steppes they raid the Manahil, who pay them back in their own coin, the Mahra, the Hamumi, and the 'Awabitha. Extending up to the great desert, they raid far into the sands. The Nahd let them visit their markets through fear only, and they are an ever-present danger to small unguarded parties of travellers. Having no settled habitat they are hard to punish and have always proved elusive and wary. But if they raid far they are also raided from afar, and I heard of the case of a young warrior of the Southern Ajman from the neighbourhood of Kuweit who, proceeding to Nejran in the winter of 1934–35 to espouse a damsel of the Yam, raided the Sei'ar on the Hadhramaut borders on his way home and took five camels to Kuweit. In their own country they bark loud enough, but when travelling in small

numbers over the main routes of Qu'aiti territory they adopt a hang-dog mien, trying to remain anonymous, choosing the byways and travelling by night, for every man's hand is against them. The only places at which they appear openly are Shibam, where they behave themselves, and Meshhed, during the time of the annual fair, when they sell their camels.

Seen from the air the country through which we were to travel appears like a nightmare, and I have often been haunted by the fear of being lost in it without a compass. It is an appalling maze of deep irregular clefts slashed and scored in a flat landscape of utter sameness.

During our week in Shibam we paid two visits to Seiyun and one to Tarim, and then started off to the Sei'ar country with ten camels and a mixed caravan of Sei'ar and Harizi. Our first night's halting-place on November 24 was outside the village of Al Atfa in the mouth of the Wadi Ser. We resisted an invitation to camp in the village on the plea that we were to start early, and camped in the open on a barren plain of sand with a wonderful display of stars.

The next morning we travelled up the Wadi Khonab and visited the tomb, or rather a tomb, of the Prophet Salih. The tomb is about 64 feet long and 11 feet wide, and is contained in a long low building. There is a Himyaritic inscription set up at the head, and there are a number of fossils laid on the tomb. Local tradition has it that if any of them are removed they return to the tomb of their own accord. Hasan kindly pocketed one of them for us, but so far it has remained under control. It made a journey from Aden to the British Museum and back through the ordinary medium of the post and was identified as an Eocene gastropod *Campanile* species indeterminate. The tomb has previously been visited by the Bents and by Colonel Boscawen. It has changed much since the Bents' time when it was not roofed.

Having inspected the tomb and its surroundings we retraced our steps, and later in the afternoon turned into the Wadi Ser, where we camped for the night in a wide open space where two other wadis joined the Ser. Our road next morning led northwards through a narrower part of the wadi. At first there was plenty of vegetation, but it soon became scanty and there was merely a waste of stones, a few bushes, and some small plants. A little sesame was being cultivated round one of the few small villages, and one of them, consisting of mud and stone cabins, had several tunnel-like buildings which are used for storing grain. There were a lot of dogs yelping round a dead camel, and the villagers were busy ploughing the sandy soil. We had had some delay in getting away from Shibam, due to the fact that the spate had come down during our visit and the camels were finding easy employment in the fields at five dollars a day.

Gradually we drew into the narrower part of the wadi and our path, though level, became stonier. Soon we reached the Wadi Latakh with the tiny village of Al Had in its mouth. Near by was the tomb of a *weli* or saint, and we came on a rough Himyaritic inscription on a massive boulder standing upright at the side of the wadi. So far we had followed the route that the Bents had trodden in January 1894, and here was the inscription which Mrs. Bent describes in 'Southern Arabia' (p. 129). The Bents thought that it was a caravan signpost.

A little farther on we turned right into the Wadi Sodaf and were now in Sei'ar country. Sand, stones, *sumr* (*Acacia spirocarpa* Hochst.), and *harmal* (*Rhazya stricta* Dcne.) seems an adequate description of our way. For some distance the wadi was wide, but in its upper reaches it naturally narrowed and, as each successive junction with its tributaries was passed, the track, which had at first been smooth and firm, deteriorated markedly. For the greater part of the day's march which brought us to its head it became extremely stony and we could not ride. The vegetation became thicker as we ascended the wadi, but there was little more variety. There is not much water to be had, though supplies are generally adequate for the few inhabitants and travellers.

Now and then we passed small caravans of Sei'ars on their way to Shibam carrying *'elb* trunks, charcoal, and *saf* (*Hyphaene thebaica* (L.) Mart.) for making mats. Whenever caravans cross all members exchange greetings as they pass. It is a pleasant custom and I always enjoyed the handshake and the word exchanged. The Badawin clasp their right hands together with a loud smack and make a kissing noise. Usually no time is lost over these salutations, but we had with us on this journey Suleiman, the son-in-law of Tannaf, and he generally stopped to talk, with a consequence that the whole caravan was often held up. Our camel men were the noisiest with whom we had ever travelled. They were in their own country and secure, so they could shout and sing to their heart's content. The Sei'ars have a curiously "refaned" way of speaking and Suleiman's was exaggeratedly so. He was a noisy and rather self-assertive person with a most unmusical voice which he exercised at frequent intervals. As the wadi narrowed, the echoes from its walls became louder; our Badawin always shouted at each other even when only a few yards apart and the echo seemed to encourage them to greater vocal effort.

It was in one of our noisier spells that we met a small party of five or six men on camels who dismounted and waited for us, but made no response to our greetings. The omission was so curious that our party was immediately stilled into complete silence, while we asked what was the reason. They begged us not to say that they were on the road as they had a row on with some of the people in the neighbourhood.

There were three little villages in the wadi, Dar Sodaf being the last. It consists of a few hovels, only one being two-storeyed. There is also a well with some stone cabins round it, rather like those in the west of Ireland. A few hours' journey beyond Dar Sodaf our Badawin pointed out to us a long grave which they said was that of Nebi Mola Sodaf from whom the wadi and the village take their name. They could or would tell us little of their prophet, perhaps because Hasan made remarks about his not being "written." He may possibly have some connection with Sadaf whom Arab genealogists give as the descendant of Hadhramaut, the son of Qahtan.

On the day we were to reach the head of the wadi we found for the first time no pleasant *'elb* tree under which to take our midday rest, and spent the time dodging the sun round a large boulder. The others cooked a midday meal sitting quite happily round a fire in practically no shade at all. Ubeid, the broker of the Sei'ars in Shibam, who had been sent with us to make himself useful, but with whose company we could very well have dispensed,

made himself a shelter with his indigo-dyed cloth spread over a couple of sacks, and under this he smoked his pipe. During the after-lunch conversation the Sei'ars told us that they gave their girls to any one who wanted them. After about a couple of months' trial the man might marry the girl, otherwise she would be returned with thanks and without ill-feeling.

It always took at least half an hour to reload after the midday halt and there was generally merriment over hoisting Hasan on to his camel. He often changed his mount two or three times during the day, complaining that it was either too old, too young, or just had an uncomfortable movement. It took anything from five to eight or nine men to hold the camel and Hasan in readiness to mount. With his cigar firmly clenched between his teeth, with much shouting and objurgation, the camel was allowed to rise as slowly as could be managed. The manoeuvre rather reminded me of letting a balloon go up.

During the afternoon we were met by 'Awadh bin Tannaf, the son of the Sei'ar chief. Tannaf had heard that we wished to visit his country and, anxious to obtain our bounties, had sent his son-in-law whom we met at Al Atfa, and now his son, to meet us. We climbed steadily all the afternoon while the wadi became narrower and narrower until we reached an *'Aqaba*. When we had mounted this we found ourselves again, for the first time since we had descended to Du'an sixteen days before, on top of the world. It was a brown stone *jol* utterly barren. Once again the world appeared in a series of levels, and although it was dull enough country it was pleasant to see again for a short time something more open, and nice to be able to ride again over smooth ground.

At first we followed along the edge of the Wadi Sodaf and twenty minutes brought us to its head. In the slight depression there was a little vegetation, mostly *sumr*. After this we climbed to a higher level and just before six reached our highest point on the plateau land to the north of the Wadi Hadhramaut. It was over 3600 feet and we had climbed a thousand of them since morning. When we had enjoyed the view over the distant horizons we descended towards Qa' al Fadhul, near which we camped in an open stony plain with a little vegetation. We were now on the watershed which separates the wadis running south towards the Hadhramaut from those that run north into the Great Desert.

We had started off from Shibam with Ba Rumeidan, the home of Tannaf, as our immediate objective, and we had made arrangements for our camel men to stay there while we went on through the Wadi 'Eiwa to the edge of the desert. Our party had contracted to take us to Ba Rumeidan in three and a half days and we had now been travelling for that time but had not yet arrived there. Inquiries elicited that it would take us the best part of two days' march to reach Ba Rumeidan and from there to the edge of the desert would be another four days. As I had not unlimited time this was not feasible, more particularly as I could obtain the information I wanted from Suleiman and 'Awadh. They pointed out to me the directions of various places and the time it took to reach them, and after that we started on our return journey, stipulating for another route.

It was after half-past nine when we mounted and rode northwards over

the *jol* which was even more barren and desolate than the way to Du'an. There were a few miserable-looking shrubs but little else, though we soon came in sight of the date palms and the five *dars* which mark the settlement of Qa' al Fadhul. We passed by the *qarif* or water-hole from which our supply had been brought the night before. Its supply and that of other *qarifs* at Qa' al Fadhul depend on rain, there being no other water northwards until beyond Ba Rumeidan. We ourselves carried water with us in skins as we should find no other during our day's journey. Grazing for camels, too, was practically non-existent and consisted only of stunted shrubs in occasional depressions. We saw little signs of other life on this *jol*, though very infrequently a lizard scurried away at our approach. Unlike the *jols* we had crossed to reach Du'an, which were edged with trees and shrubs, those up here were quite barren. There were flat-topped hills all around but no peaks to be seen. Our track however was well marked and now and again we crossed others. We met no one on this day's journey, but we saw on one occasion some footsteps in the gravelly sand which 'Amr, our *muqaddam*, stopped to examine and announced the names of those who had made them.

From an occasional higher level we often had distant but dull views, endless flat brown gravelly series of plateaus, varied now and then throughout the day by patches of black. At noon we passed across a shallow depression marking the boundary between Sei'ar and Kathiri territory. When we had reached the level of the flat country on the farther side we saw for the first time a feature, a small pointed hill a mile or two ahead, and soon passed the first of a number of groups of ruins. This place was called 'Urum, and all the ruins consisted of rough dry stone erections belonging to a bygone age which our Badawin attributed to the children of 'Ad. The buildings could not have been big enough to shelter adequately normal-sized human beings, and the absurdity of their sufficing giants did not seem to have occurred to our Badawin.

At one o'clock we halted near some ruins which had looked rather exciting from a distance, descending from our camels between the small pointed hill before referred to and another little hill with a ruin on top. We climbed up the latter to have our lunch, but it was extremely uncomfortable as there was no shade. This hillock was the first of a series of four, the first three close together and the fourth some distance on, but the whole did not extend over a greater distance than a quarter of a mile. The first three hillocks were crowned with circular ruins and between the third and fourth there were fifteen heaps of stones in a straight line on the crest of the slope. Below the slope was level ground and perhaps a quarter of a mile ahead another row of stones and ruins on a hill. In between the level ground was sprinkled with chert flakes indicating the location of a factory of chert implements. During the afternoon our track lay along one of these straight lines of upright stones, curiously arranged. Our Badawin could not tell what purpose they served.

For most of the afternoon we travelled over the same desolate landscape, coming eventually to depressions marking the upper reaches of the wadis or sh'abs in which grew scraggy acacia. We halted finally at a barren spot at the beginning of the Wadi Qubhudh down which we were to travel the next morning. The height was only 3600 feet, but we passed here our coldest night

of the whole journey, for the thermometer registered 37·3 at 6.45 in the morning. As usual however it soon warmed up and we had not ridden far down the side of the wadi before we had thoroughly thawed. Presently I picked up a possible stone implement and asked the Badawin to keep their eyes open for others. They were not surprised at the idea that these instruments had been made by human agency, but said that nowadays flint was only used for obtaining fire. Matches, indeed, are a scarce commodity not only amongst these people but down the Wadi Maseila. Nearly every man carries a small piece of flint and a small piece of iron with which to make his fire.

Near by the first of the two *dars* which mark the settlement of Rieidat al Kathir we met the only inhabitants of the place, a woman with a donkey. She had come to see how her crops were getting on, for the place is only inhabited when the water comes, and the people live for the most part at a spot a few miles away. Low bunds of loose stones had been carefully built to steer every drop of water that arrived into the scanty cultivation. There were a number of *'elb* trees round the place but no dates. Suleiman spun a long yarn about a raid on the place in which he had been concerned some years before, and our other Sei'ars told us of a raid they were plotting on the Mahra.

After leaving Rieidat the only vegetation was thorny *arafot* (*Acacia albida* Del.) and other bushes which became thicker and thicker as the wadi became lower. With the increasing vegetation there were a few birds, most of them of the same colour as the stones and earth. After a few miles the track deteriorated and we had to dismount. Presently we came to an *'aqaba* leading down to the wadi bed. At its head we passed a flint outcrop which had clearly been worked in some distant age. Part of it is still worked, for the Badawin use it to obtain their flints. The *'aqaba* was very steep and extremely bad going. In time however camels and all negotiated it safely and at the bottom we found a comfortable seat in the shade of rocks where we had our lunch. As a contribution towards it 'Amr and Suleiman brought us some of the hard fruits of the *sar* tree (*Hyphaene thebaica* (L.) Mart. from which the fronds called *saf* are cut), but they made no appeal to us. From this point the wadi belongs to the Al Hariz tribe, of which 'Amr's father was the sheikh. Such inhabitants as there are live in caves in the walls of the wadi, some of which are very large. The entrances are built up with loose stones and only a small gap left for man and beast to enter. Smaller caves are used for goats. Some of these holes are so small that they appeared to be little bigger than rabbit hutches.

During the afternoon we passed junctions with several other wadis and camped in a wide and pleasant spot. The next morning's ride was worse than any we had yet experienced, and in fact was more scramble than ride, for we could not expect our camels to carry us over the appalling boulders which continually blocked the path. Unlike most wadis which are better as one approaches their mouths, the Wadi Qubhudh became steadily worse and worse, winding a great deal and full of round smooth boulders, some of them only a few feet in diameter but others almost as big as small cottages. We climbed over, under, and round these boulders for several hours while

Suleiman kept telling us that the place where we should stop for lunch was close by. He repeated this every few moments while we grew hotter and more bad-tempered slithering amongst the stones.

We had only been going a short distance on our afternoon's stage when the wadi gradually became wider and the going better. Presently we were able to ride on a good sandy surface away from the *seil* bed. Shortly before five we began to see signs of comparative civilization and the respectably-sized village of Qubhudh came in sight. As we drew nearer two small boys ran out to meet the caravan, kissing the men's hands in greeting. Other children, men and women, soon followed, for this was 'Amr's home, and it certainly looked very attractive with the '*elb* trees and dates round it. We were greeted by 'Amr's toothless father, Salih bin 'Ali, the sheikh of the little tribe, who gave us a warm welcome.

The village of Qubhudh consists of a number of fair-sized houses round which are many underground cellars for storing grain. Near by it is the grave of its patron entitled by the people a Nebi. He also was a giant of the time of 'Ad and his grave was 20 feet long.

We had expected that we should be met in the morning by a friend in Shibam with a car, but, as we learned afterwards, a family bereavement had prevented his coming early. When there were no signs of him we rode on to Juwada and from there passed again the village of Al Atfa, where we had camped on our way up. We had passed it then on the western side, but we were now a little east of it. Soon we reached again the junction of the Wadi Ser with the Wadi Hadhramaut, meeting on the way a messenger from our friend in Shibam saying that he would soon arrive. We sat down to lunch under a tamarisk tree and we had not finished when Sheikh Sa'id Laajam drove up in a smart Buick. It was not long before we had some of our luggage piled up in the car and in twenty minutes drove the 5 or 6 miles to Shibam, which had taken us two hours to ride on camels. We stopped there only long enough to take in petrol and to exchange greetings with the Governor, Ferai Sa'id, and then made for Seiyun and Tarim.

This was the third brief visit we paid to Seiyun, the capital of Kathiri land. The Sultan, 'Ali bin Mansur, is one of the most delightful and perhaps the most lovable of the chiefs of the Protectorate. He is also probably the most truly cultured and has a real and earnest desire for peace in his country. The small revenues of the state are spent entirely on the public service, as he himself lives on an extensive private fortune derived from property in Singapore. The Sultan, who is not a treaty chief, but under protection by virtue of the Qu'aiti–Kathiri agreement, rules directly over the towns and villages of Seiyun, Tarim, Taris, Al Ghurfa, Mariama, and Gheil. He is also Sultan of the Shenafir Confederation, but not leader, for it is not a *Zei*. The confederation consists of five tribes, including the Kathiri and the 'Awamir, living on both sides of the main wadi and, extending up to the sands, covers the largest area. In the Wadi Hadhramaut the territory of the Kathiri Sultan is recognized as extending from just east of Shibam to just east of Tarim. The right bank is much more fertile than the left. Large numbers of the Kathiri live in Java, so that it is a wealthy tribe. The Al 'Amr clan, like some of the Tamimi tribe, have expressed a desire for direct British rule.

Space does not permit of a description of the welcome comforts and luxuries of Tarim. Perhaps the two most interesting sights we saw were a recently discovered Himyaritic tomb and a dance at Dammun, just outside Tarim, in honour of a successful ibex hunt. As we were reminded by representations of the ibex on stones from Himyaritic ruins in Tarim that animal was sacred to the ancient South Arabians, and it is probable that the pagan celebrations we witnessed were a relic of the old worship.

Miss Stark is probably right in her identification of the Dammun near Hajarein in the Wadi Du'an as the place mentioned by the poet 'Amr al Qeis ('The Southern Gates of Arabia,' p. 162). Hajarein was the centre of Kinda rule and its suburb of Dammun is within a day's march of 'Andal as mentioned by the poet. The distance however is an easy one to cover in that time, and I still cling to the hope that 'Amr al Qeis' Dammun is the more romantic one near Tarim, where we witnessed this ancient ceremony. Of course, to-day 'Andal can be reached in a few hours from Tarim, and though 'Amr al Qeis had no motor car, he boasts in the Mu'allaqat of the speed and prowess of his horse. Perhaps indeed the line quoted by Miss Stark is also a boast. Another point in favour of my Dammun is that the poet refers, in another line, to the Yamani living there. To-day the Tamimi still own the place, though their Bin Yamani clan live a little farther down the wadi at Qasm.

Tarim is ruled, on behalf of Sultan 'Ali, by sons of his uncle. The wealthy Seiyids on leave and in retirement from Singapore find a modest outlet for their business acumen and their money in running the municipal affairs of the town. They do this very well, for they cast a budget, which balances with the aid of a $12,000 annual contribution from themselves. Actually the sums they spend on dispensaries, schools, and other public and charitable services is a large one. They disburse still more on settling tribal troubles. It is worth while mentioning that several of the Seiyids are Justices of the Peace for Singapore. They use other methods to maintain it in Tarim.

We left Tarim with its swimming baths, "mod. cons.," telephones, electric light, fans, arm-chairs, and crêpe-de-chine equipped beds, on December 6. Our kind hosts, the Seiyids of Al Kaf, accompanied us by car as far as Masilat as Silma to see us off. The name Wadi Maseila—the Valley of Floods—is applied to the Wadi Hadhramaut from Husn Dhoban Maseila on the Tarim side of this place, which is 2·8 miles from Tarim.

The Wadi Hadhramaut is the key feature of the geography of the country to which it gives its name. North and south of it the land rises to extensive plateaus which form watersheds. The one to the north, about 3500 feet above sea-level, has a series of wadis draining north into the sands, and another series draining south into the Wadi Hadhramaut. The watershed to the south, consisting in the same way of plateaus, is higher than that to the north, for it rises to some 6000 feet. From it the wadis drain north into the Wadi Hadhramaut and south to the sea.

This description is typical of that part of the country through which the wadi runs more or less west to east, that is to say, from about Husn al 'Abr to beyond Tarim. Over this stretch the bed of the wadi falls from a little over 2000 feet above sea-level to a little under. A line running due north and south

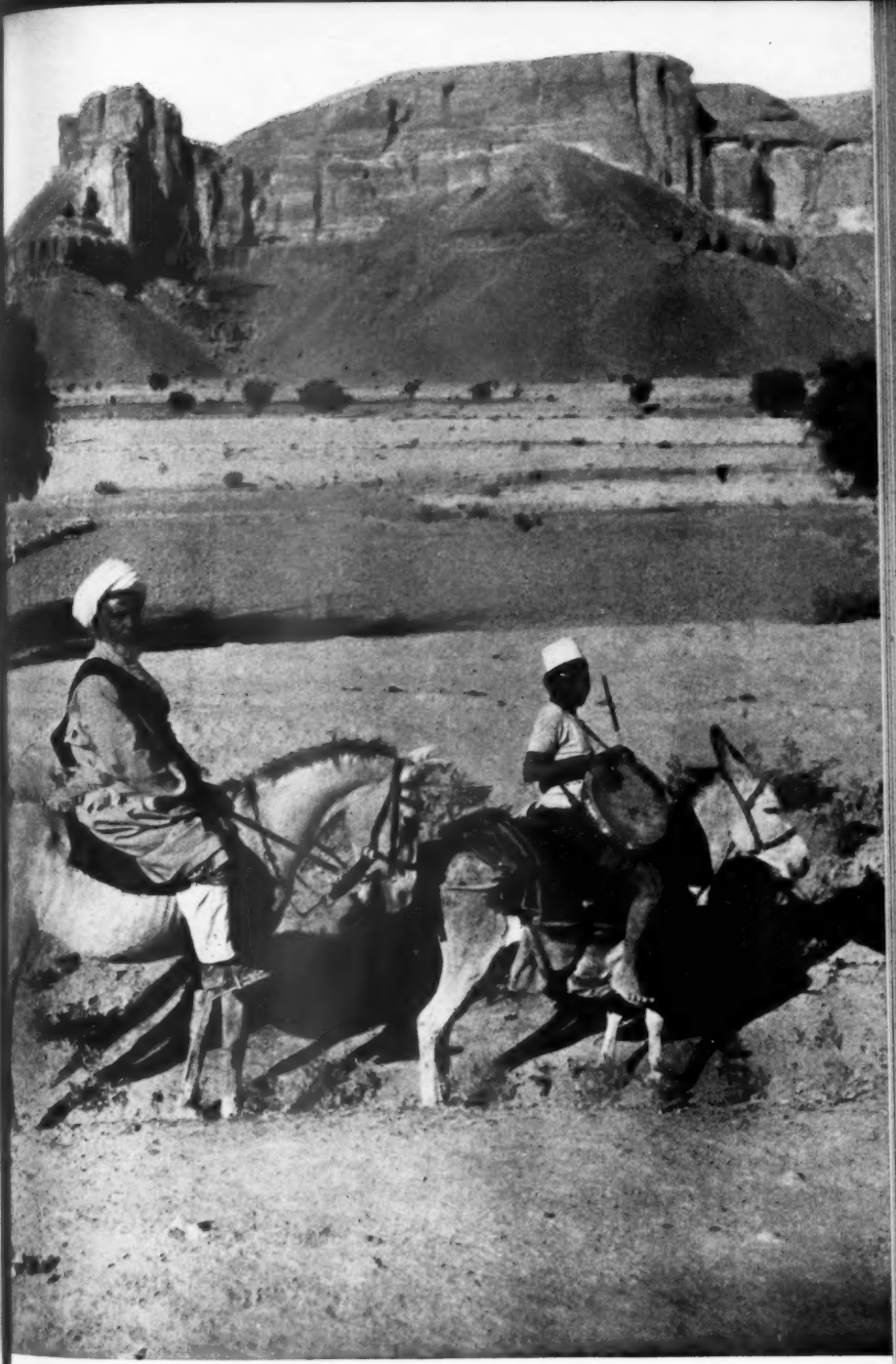
through Shibam gives a depth of 120 miles of wadi, mountain, and steppe land between the desert and the main wadi, and 125 miles between that wadi and the sea. As the wadi turns to the south-east however it of course modifies these proportions, but the country maintains the same general formation. The wadi finally turns south and breaks through the coastal range. The cleft in this range is a very striking feature as we saw it sailing by dhow from Seihut to Shihr, and as I have twice seen it from the air. The river-bed is most peculiar, for it is extremely wide near its source and narrow near its mouth. At the widest point at which we crossed it, between Haura and Henin, it was $4\frac{1}{2}$ miles wide. Farther west I believe it is as much as 8 miles across. In the lower reaches of the wadi however we found places where the width was less than 100 yards.

The length of the wadi west of Henin has not been determined, though it is about 75 miles to Husn al 'Abr. From Henin to Tarim is 55 miles, and from Tarim to the sea 226 miles. The figures given in this résumé of Hadhramaut geography are of course approximate, and the summary, while based on observed facts, is deduction in so far as parts of the country unseen by land or from the air are concerned.

It is curious how immediately east of the walls of Tarim the wadi changes in all its aspects. Politically it runs again into Qu'aiti territory, but territory not included in any of the five provinces, though there is a Qu'aiti Governor at 'Einat who is responsible for relations with the Tamimi and Manahil tribes, who both have A agreements with the Sultan. The wadi therefore remains politically Qu'aiti until it becomes Mahra.

The Tamimi and the Manahil, together with a small tribe called the Al as Sumah living in the mountains to the north of 'Einat, form the Beni Dhanna Confederation. Qasm is the capital of the Tamimis, and all the villages between Dammun, almost a suburb of Tarim, and Fughma belong to them, although there are Manahil sections also living in As Som and Fughma. They are a part nomad, part settled tribe, and emigrate, a few to Java, but mostly to the East African coast. The Manahil are a strong nomad tribe and possess no towns worth the name. Sena, An Neid, and Taburkum are their principal headquarters, and Qabr Hud is in their territory. They occupy a large stretch of country astride the wadi extending from east and north of the warlike Hamumis up into the Rub' al Khali. They breed camels extensively, both for sale and for hire. Their animals are esteemed as finer and stronger than those of the Sei'ar and are worth about 200 dollars a head. Very few of the Manahil emigrate.

It is curious also how the standard of wealth changes east of Tarim. It is not to be supposed that this denotes any diminution of business capacity on the part of the Tamimis, for some of them make money in Java, and the chief of the Bin Yamani clan at Qasm is said to have an income of 40,000 dollars a month from Java. The reason for this change in the standard of wealth seems to be that in the course of years the Tamimis have developed much stronger connections with East Africa and therefore succeeding generations find it easier to go there. The Hadhramis in East Africa as a general rule indulge in less remunerative occupations than those in the East Indies. In the Tamimi villages Swahili seemed to be the second language of most of the



The Mansab of Meshed

Wadi Hun, principal tributary of Wadi Maseila

A wayside 'siqaya'

male population, and in Qasm Mombasa was the best known East African town, for many of the inhabitants had worked there as taxi drivers or domestic servants, or had served in Wavell's Arab Rifles during the war.

Another, and possibly the most striking, change east of Tarim is that the Wadi Maseila not only gets considerably narrower but becomes a river for most of its length. It is perhaps one of the nearest approaches to a genuine river in the whole of Arabia, and it is interesting that the Qu'aiti dominions have on the west another almost-river—the Wadi Hajr. Unfortunately I have not yet travelled up this wadi, but I have seen it from the air on a number of occasions and its broad stream set in the midst of a wide band of cultivation and green vegetation is indeed a striking sight. It differs from the Wadi Maseila in that it is much more extensively cultivated.

The Wadi Maseila receives its first principal contribution of water from the Wadi 'Adim, and its second a little lower down from the Wadi Hun. The only other important tributary above the waterless part of the wadi is the Wadi Sena. From Basa' to Marakhai the wadi is in ordinary times dry, and this part is known as Al Liz'a. On leaving Basa', indeed, we had the impression of going uphill as far as Jebel Qafi, from which point it appeared to descend fairly steeply. I confess however that the aneroid showed diminishing height. From Marakhai the river flows perennially to Buzun. The principal tributary below Al Liz'a is the 'Akid.

Occasionally the spate comes down, and when it does the route we followed is for much of its way impassable. We had pointed out to us from time to time the alternative paths used, well up the sides of the wadi, where traffic passes during the flood. At times of flood the volume of water passing through the wadi must be terrific, for we saw high up in the trees debris which it had carried down. Lower in the wadi the high-water mark was 20 feet up the vertical walls. Floods such as these render cultivation in the *seil*-bed impossible, and the Manahil and Mahras carry out their planting on the level surface of the hard sand and soil brought down by the river through which the spate has cut its channel, leaving almost perpendicular banks, sometimes as much as 20 or 30 feet high. Owing to the water vegetation is plentiful, and in many places the trees are so thick and so high that they might be described as forming a forest.

When we parted from our Al Kaf friends at Masilat as Silma we drove on to 'Einat, a city of Seiyids, which besides the Qu'aiti Governor has also a *Mansab* to superintend its spiritual affairs. We found our caravan at Husn as Sufeira, 1 mile beyond Qasm and 17½ from Tarim. Here there is a castle of the old-fashioned description with turrets at the corners. Our men were Manahil and Tamini, and we had with us a mean little Seiyid, called Muhsin, who had been kindly sent by the Al Kaf for greater protection. We had five riding camels and eight for luggage. Donkeys cannot be used down the Wadi Maseila on account of the waterless stretch. They would have difficulty, too, owing to the depth of water at some of the fords, for the track crosses and recrosses the river and in places the water was up to above the camels' girths.

Although we started off as a modest party we continually gained recruits by other caravans joining with us. They were often mixed caravans of goods and passengers, and one of forty included a small family consisting of a woman

A wayside 'siqaya'

Wadi Hun, principal tributary of Wadi Maseila

with an elderly husband and two children who were off to Zanzibar to try and make a fortune. By the time we reached Seihut we were at least ninety camels strong.

We had intended on this first day to night at Fughma, which is the *Madhwa*, or place of camping, for the first day's journey out, but we were so late starting that we reached no farther than As Som, the *Mabrad*, or place of midday rest. The *Marahil*, or stages, which we had been given in Tarim for the journey beyond As Som were, Qabr Hud–Sena–Taburkum–Hamir–Bin Sheikh Nan–Hei'un–Marakhai–Bin Qora–Al Qoz–Maqrat–Teheir–Buzun–Gheil–Semarma–Al 'Ais–Seihut. A few of the stages towards the end are exceptionally long and could not have been performed, at any rate by loaded caravans, as half-day stages.

During the afternoon we explored the imposing ruins of Husn al 'Ur perched on an island which rises to 100 feet above the level of the wadi, and found on the walls an inscription hitherto unrecorded. These island sites were clearly popular among the ancient inhabitants of the Hadhramaut wadis. Some of them, for instance Shibam, are used to this day, and we had seen another ancient example at Gheibun in the Wadi Du'an. We were to learn that the Wadi Maseila has several of them, and we found another with fortifications at Husn 'Ad. It is probable too that Qara, near by the ancient dam we passed after Qabr Hud, is a third, and Maqrat may be a fourth. Possibly this is the place referred to by 'Amr al Qeis in the Mu'allaqat. The only other trace of ancient inhabitants was the rock writing at Sad, but this was clearly executed by travellers. The presence of these forts suggests most strongly that the wadi formed one of the ancient high roads into the interior. Indeed it must have been, for it is a natural and comparatively easy route, and possibly the one described by Ibn Mujawir.[1] It is supposed that it was the route followed by the Azdites in their great migration from Yemen to Oman.

Qabr Hud, like Qabr Salih and other giants' tombs, was probably a sanctuary of the old religion. To-day the village, which consists mostly of well-built houses belonging to rich Hadhramaut families, is only inhabited at the time of the pilgrimage in the month of Sha'ban. We arrived there at night so that our first glimpse of it was in the faint white mist of the morning, which was slowly drifting away from the sha'b, on the side of which the tomb lies, when we climbed up above our camping place in the wadi to see where we were. The calm and beauty of it made a great appeal to us which was not dispelled with nearer examination. In the whole of the village and sanctuary we met no sign of life save a young heifer and a few pigeons, and no doubt the silence and peace contributed much to the atmosphere of calm and sanctity which pervades this holy spot.

We went up the broad and imposing flight of steps and explored the innermost recesses of the prophet's tomb. The principal part of the sanctuary is the dome covering the cleft in the rock into which the prophet disappeared when hard pressed by his pursuers. The actual tomb, some 90 feet long, stretches up the side of the hill behind this dome. Below the dome is a large rock, surrounded by white colonnades, which is said to be the hump of Hud's petrified camel.

[1] Freya Stark, 'The Southern Gates of Arabia,' p. 310.

We left Qabr Hud on the 1st of Ramadhan. Our midday halts were of course primarily devoted to lunch and to rest, and I wondered on this day how many of the caravan would fast. The only one to do so was Seiyid Muhsin, and he did so, as he did most things, in a very blatant fashion. After lunch and a rest my wife and I often occupied ourselves with writing, collecting natural history specimens, or taking photographs. Hasan usually rested or slept all the time. The Badawin too often slept, though sometimes one would take a companion's head in his lap and remove the livestock with the point of his curved dagger.

From Qabr Hud our way led over ground as yet unexplored, and, save for an aerial reconnaissance, unseen by European eyes. There is again a marked change in the methods of life of the wadi, and the people have fewer outside contacts. Many of them had never seen a European before and on several occasions we were taken for a new kind of Seiyid. After leaving Qabr Hud we were not to see dwellings of the typical mud *dar* type until we reached Qal'ana. Habitations for the most part are either caves under the wadi walls built up with mud and stick facings, or mean huts of mud and sticks with flat tops and not more than 5 feet high. These soon became the commoner type and were almost universal in Mahra country, the only exceptions being a rough mud-domed *weli's* tomb at Rahta, a small *dar* at Maqrat, and some mud dwellings at Buzun. From Qal'ana to Dhubeia the buildings were mostly of mud but usually only a storey high. The greater number of the settlements are ribbon-built and extend for quite long distances along the banks on which the cultivation is carried out. The river is generally some way from the foot of the bank, and the method employed by the Manahil and Mahra to draw water for irrigation purposes is ingenious. Channels are dug from the river and a deep hole made at the foot of the bank. A scaffolding is erected over the hole to carry the usual well machinery, and a mud aqueduct, supported by tree trunks and branches, carried the water on to the higher level ground where it is distributed by canal in the usual way. A sloping walk of timber covered with earth is also provided for the team of camels, oxen, and humans. Some of the cultivation was hedged round by branches, and we saw men and women working. In the wadi bed there was plenty of vegetation, principally *rakh* (*Salvadora persica* L.) and *'ithl* (*Tamarix* sp.), but there was also at first a great deal of sand, some of it blown into big drifts.

Below Sena we passed the ancient dam noted from the air by Squadron-Leader Rickards. It is very strong looking and well built of masonry and cement, and it joins an island hill, which is simply called Qara, to the left cliff of the wadi. The river now runs in a channel which fills the wadi between Qara and the right cliff. Shortly after this we met the *Mansab* of the Manahil tribe collecting his tithes from the inhabitants of the wadi, and then came to the long-drawn-out settlement of Taburkum. Below Taburkum the river was much divided into a series of delightful streams rippling busily over the stones between pleasant patches green with grass.

At Basa' where the river disappears the water-skins were filled up from the last pool so that we might be supplied for the next two days. While this operation was being carried out we met a man with his wife and child encamped near by, and he volunteered to take us to a place called Sad to see what we

understood were some rock paintings. After a ride of forty minutes he brought us to a spot under the left bank, and, full of anticipation, we climbed up the cliff. There was a natural seat or shelter hollowed out three-quarters of the way up, and on the rocky ceiling there was a good deal of writing painted in red and white. The work looked perfectly fresh, but it was, I suppose, extremely ancient, for some of the characters resemble Himyaritic. Others are similar to characters in rough inscriptions I saw in Soqotra.

When we had photographed them we went on after the caravan and presently came across one of our Badawin, named Salih, trying with the advice and aid of the others to shoot a couple of sitting birds. The birds, called *buri*, were large creatures, rather like guinea fowl, and they sat on a fallen tree trunk while the preparations proceeded. Salih had them beautifully enfiladed and lying at a range of about 10 yards took long and careful aim. The birds made no attempt to move. Silence and stillness were enjoined upon us. At length Salih pulled the trigger. There was a terrific explosion, and the two birds flew unconcernedly away without so much as a squawk.

As we progressed down the wadi the walls became less monotonous and less regularly high. We had many views of quite distant peaks and pyramids. Frequently we noticed curious figures and statues carved out by the weather among the broken sandbanks and the rocky cliffs. Our Seiyid told us that considerable digging in Al Liz'a, even to the depth of a hundred palms, had failed to find water. None the less there is a good deal of vegetation, mostly tamarisk. After we had travelled two days without water we found a deep pool left by the passing flood which looked particularly muddy, green, and unappetizing. Still our Badawin enjoyed it and so did the camels. During these two days we had met occasional Manahil, principally women grazing animals. Our Badawin were continually endeavouring to find water which they said they knew existed. They told us that the wandering shepherdesses were anxious to keep its whereabouts to themselves for the sake of their families and their flocks.

Just after leaving the water we met a small caravan, whose members told us the result of the raid the Sei'ars had planned on the Mahras. They had attacked a south-bound caravan, killed one man, wounded another, and looted the goods. The news was asked for and given in very much the way that "fans," who have been temporarily out of touch with newspapers, ask for and are given the result of a football match.

At the place where we had found the water the Wadi Hadhuf enters the Wadi Maseila and from this point the left bank of the wadi belongs to the Mahras and the right to the Manahil. On account of feuds between the two tribes our Minhali camel men announced that in future they were Tamimis.

We spent one more waterless night and then, passing Sha'b 'Udha'ut, which marks the point at which the whole wadi becomes Mahra, came, in an hour or so, to Marakhai, where the river emerged in a narrow stream beside the left cliff. Frogs and small fishes abounded in the clear water. Birds were singing in the trees and brilliantly coloured kingfishers stood on tree trunks in the river feeding off the fish. It was grassy underfoot and the wadi was beautifully green and almost English in appearance, as the *'ithl* and *'ais* (*Tamarix* sp.) are so like young fir trees. We were soon soaked with the dew

from the branches. The morning light lit up the dew-covered spiders' webs and the grass seemed more emerald green than any we had known. The wadi was not more than 100 to 150 yards wide, but, except for the narrow ride of green turf over which we were passing, it and its slopes were packed with trees. There was quite a riot of variety in the vegetation—*'ithl*, *'ais*, *rakh*, *'ishar* (*Calotropis procera* Ait.), *harmal*, a little *sumr*, *khuweira* (*Cassia obovata* Coll.), *lejawa* (*Zygophyllum* sp.) and a few *sar* palms. In all this the *ariata* (*Conocarpus erectus* Jacq.) soon became the most striking object. There was a lovely copse of these trees ahead, some 40 or 50 feet high.

Now and then we passed patches of cultivation and others now disused. The people cultivate one season in one spot and another somewhere else, clearing the ground by felling and burning the trees. A pleasant rural touch was given by the presence of cows grazing on the grassy pasture. The cattle are small and resemble those of Soqotra. At one or two villages there were fishing nets, for in these lower reaches of the river the Mahra catch small fish in the stream.

At Bin Qora the wadi makes a big bend to the north, and we had pointed out to us a short cut over the *jol* for foot travellers which cuts off in two hours the bend in the wadi which camels take six hours to follow. We camped for the night just beyond the little village of Hadhafa and next morning took on our first *siyar* representing the Bin Sahal clan of the Mahras. He was a nice-looking lad of not more than sixteen, and the responsibility of looking after our large caravan seemed to sit on him quite lightly. At night when we were camped in some deserted corner of the wadi he would climb up the cliff and announce to the echoing rocks that we were under his protection.

Hitherto our journeys had been for the most part through territories of a single tribe where *siyars* had not been necessary, or along much-used highways where their presence was scarcely noticed. Going into Mahra territory with a Manahil and Tamimi caravan reminded me of travelling in an International train when the nationalities of the ticket collectors change at every frontier. The Mahras indeed seemed almost a foreign people, for their language, clothes, and customs are different. Their neighbours on the west seem scarcely to regard them as Arabs, though they themselves consider they are of much purer Arab stock. Their capital is Qishn, but the Sultan resides these days in Soqotra, which has been from immemorial times a foreign dependency of the Mahra Sultan. The ruling house is the Bin Afrar clan, and of the forty-two other clans that inhabit the great stretch of Mahra country three live in the Wadi Maseila. We were to meet the Bin Zueidi later. The third clan, the Bin Nebhani, is small and unimportant. They were even neglected by our camel men. Until fairly recently they lived in the Wadi Dohum, but sought refuge in the Wadi Maseila after a war.

At Bat-ha we had to mount a steep *'aqaba* as the river fills the wadi bed. The view from the top was most beautiful, for there were long straight stretches of clear green water, fringed on each bank with vegetation. These straight lengths of river gave me the fantastic idea that one day inter-tribal boat races might be witnessed in the wadi! Beyond this place we came to several hot springs. The water was wonderfully clear, but much too hot to put one's hand into it. Below the springs we came at once to the first extensive signs of

the lava which is such a conspicuous feature of the wadi for most of the rest of its length. Squadron-Leader Rickards' sketch-map of the wadi made from an aerial reconnaissance shows a number of small craters and one large crater some way down the wadi from this place. From the distribution of the lava we deduced that the wadis were in point of time older, that then they had been filled with lava to a depth in places of at least 100 to 120 feet, and that afterwards the river had carved out a new bed. Much of this country is volcanic, for there are hot sulphur springs at Shihr, and between that town and Seihut I have observed extensive lava fields from the air.

We approached Maqrat on its volcanic hill through pleasant date groves. We found its three-storeyed *dar* very palatial after the 5-foot huts of the past week. It belonged to our Seiyid and was surrounded by about fifteen stick huts. The population, men, women, and children, is about thirty-five. The scenery beyond was extremely beautiful. The cliffs were all broken up and lying in low hills with sheer rock walls in the background. We crossed the river which had been dammed and was accordingly deep in parts. At many places down the wadi the Mahras dam the river, principally with brushwood.

Below Maqrat we met the first upward-bound caravan we had seen, consisting of over eighty camels. There were twenty-three people with it, including two women and some boys. It was heavily loaded with rice and a few dates for 'Einat, and some dried fish and grain for the Badawin in the dry part of the wadi. The caravan was followed by an aged Mahra couple travelling up the wadi on foot. The old lady had an enormous silver nose ring, which is worn by many Mahra women. Men and women generally wear attractive bead necklaces, and these adornments made the members of this caravan strikingly different. Mahra caravans rarely serve the wadi higher than 'Einat. Tarim is supplied mostly by the Shihr route.

The wadi was now widening out and the vegetation was not so uniformly tall. Teheir is in a very wide plain with a considerable amount of cultivation and extensive date groves. Scattered over it were children herding goats, a man ploughing with a couple of oxen, and a number of other men and women about their several occasions. The plain was succeeded by a heavily wooded spot full of tall forest trees. Here and there in little clearings were small villages. The bed of the wadi was about 100 yards wide and the summits of the walls, which were some distance apart, 800 to 1000 feet high. We looked forward day by day to finding a part of the wadi which Wing-Commander Cochrane and Squadron-Leader Rickards have described as having walls 2000 feet high overshadowing the wadi at a place where it is less than 100 yards across. But day after day we were disappointed and in fact we never found it.

We came out of the wood to see Buzun in the distance, and took on a Bin Zueidi *siyar* who was also extraordinarily youthful. He was a cheerful soul who sang continuously, accompanying his song by the clapping of his hands, but his singing always ended abruptly with a curious noise like a gramophone that has run down. He had somewhat Mongolian features and his back view, with his hair done up in a bun, was exactly that of a Chinese woman, a familiar sight to us in Mauritius. He wore the black braided coat of the Mahras,

Wadi Maseila from the ʿAqada of Bat-ha

Maqrat on its volcanic hill

A Zueidi at forest village near Buzun

which is almost a uniform pattern, though the facings change. The Bin Afrar wear them braided with silver and the rulers themselves have gold.

Passing Buzun we plunged for a short while into the shade of the forest again, but it soon gave way to open country with many scattered *sumr* trees, though the thick vegetation continued by the river. It was even more trying riding among *sumr* trees than among the *ariata* or *'ais*, for we were badly scratched by the thorns and nothing would induce the camels, who were below the level of the branches, to stop. After this the vegetation became less and less, though there were here and there small villages with dates and greenery, due to springs. They were mostly in attractive situations in the higher corners of slopes of the wadi. Qal'ana looked in the distance an important place, for it has a large turreted castle and a number of seemingly respectable mud-built houses. On arrival however we found that the castle was in ruins and most of the thirty odd houses round it also broken and deserted. It is in fact worth comment that there was every sign of a diminishing population in the lower part of the wadi, and we passed many deserted villages below Buzun. Our Seiyid had told us before that there was much sickness in these lower reaches, and there must have been in the not far distant past a bad epidemic of malaria. Actually we were little troubled by mosquitoes and the few I captured were all *Culex sitiens*. Though we found the water good from Tarim to the sea, it is curious that in the part below Al Liz'a it has a reputation among the camel men for being sweeter.

At Qal'ana, except for occasional pools, the river came to an end. During the *seil* it reaches the sea, but it is said that as soon as the *seil* finishes it stops at Qal'ana and there are only pools beyond as far as Batahiya. After the first month the flow is only as far as Gheil, and after yet another month it only reaches Buzun. Just below Qal'ana we came to Husn 'Ad. The ruined wall crowns the hill and our Badawin attributed the work to the children of 'Ad. The situation and height were very much the same as Husn al 'Ur, and the work did not appear to be so elaborate though it was more extensive. From Qal'ana below the people look on Seihut as their market town, and we saw occasional Mahras spreading out *ariata* and *rakh* leaves which are dried and taken there for fodder. Others were gathering *ariata* wood to sell for firewood in the same place. We also passed a sha'b called Al Kohl which owes its name, according to our Seiyid, to antimony deposits.

Our way now became barren and stony. At Semarma however there was plenty of cultivation and dates, but the bulk of the population seemed to be in the cemetery, which was the largest we had seen. Below the village we climbed up on to a plateau to cut off a bend in the wadi. The plateau was barren and the only sight was the grave of another giant, Mola al 'Ain, a popular place of pilgrimage for those who have survived the perils of the sea. Beyond the deserted village of Batahiya we left the wadi for good, though we could still see it on our right. We turned a corner, mounted a rise, and fully expected to see the sea, but in fact we did not see it until late in the afternoon when we were less than a mile from it.

After lunch under a solitary *sumr* tree, not far from another giant's last resting place, we rode on to a village in the estuary called Dhubeia where we had the only unpleasant incident of the journey. Here we were stopped by

A Zueidi at forest village near Buzun

Magrat on its volcanic hill

men of the Bin Zueidi clan who wished to shoot us as they were not going to have Christians in their country. They claimed that the *siyar* system was never meant to apply to *Nasara*. The danger, which was real enough for some minutes, was eventually surmounted thanks to our Seiyid, a Seiyid in the village, but principally to Mseika, our *siyar*, who told them that their behaviour was disgraceful and that if there was any trouble he was going to fight with us. The whole of the rest of the caravan also said they would fight with us, so the Zueidis climbed down and told us we might go on to Darfat. Months later in Aden travellers from Qishn and Seihut, as well as a man from Soqotra, told us that a month or two after we had passed the *seil* had come down in a sudden flood, as it often does, but that the only man who had been swept away and drowned was the Zueidi who had been the ringleader of this incident.

We camped at Darfat rather dejectedly alongside a cemetery and only a short distance from the sea. On our thirteenth morning after leaving Tarim we reached Seihut, where we were kindly treated by Sultan Sa'ud, who represented the Sultan of Qishn and Soqotra in the town. We were housed in a large but shabby and rather dirty palace which he had prepared for us, and the whole town turned out to watch our arrival. We were looked after principally by a friendly lunatic, obviously mad and obviously friendly, but he had a rifle with which he performed all kinds of antics and occasionally made us feel exceedingly nervous. The room rapidly became crowded with visitors, and when at last we suggested we would like to rest nobody seemed very anxious to move, but the lunatic grasped the idea and with much gusto cleared every one out and proceeded to lock himself and his rifle in with us. Eventually we persuaded him to clear out as well, but he mounted guard outside the door and made it difficult even for our servants to enter. We were very interested in noticing the different kinds of greetings bestowed around the room by various visitors as they entered; some kissed a hand, others mutually avoided kisses, but the peculiar nose kiss of the Mahra was something we had not seen before. There are a few Arabs, merchants and mansabs, in Seihut and Qishn, but I am told there are none in the interior, as the Mahras do not like resident foreigners in their midst.

Sultan Sa'ud told me something of the reign of terror which the Zueidi Badawin had established at Seihut and the coastal villages. He told me that the Sultan had no control in Seihut outside the door of his house; that the Zueidis had come down into the town from the mountains a few years ago and now ran the place and took most of the taxes. At first they had stayed in the interior and then they came down into the town, gradually usurping more power, and then fixing amounts against the merchants. They elect periodically two *Muqaddams*, and these take it in turn to control the town. Seihut is a mean and dirty town of mud-built houses and nothing like the impression one receives of it from reading the description in the Red Sea Pilot. At Seihut and Qishn I saw the only tent dwellers I have found in the Aden Protectorate. Their tents, reminiscent of bell tents, are made of matting.

We sailed away on the good ship *Matrab*, a dhow of 20 tons, with a delightful crew. A journey of thirty hours brought us to a wonderful sunrise at Shihr. We spent two days in the old-world atmosphere of the town, whither Sultan

Salim, the Qu'aiti Regent, had come to meet us. The capital of the province is a mediaeval town, surrounded by a fine wall with watch towers on its three landward sides. We found the place and the people *sympathique*, though it is falling into decay and Ramadhan gave it a more than usually sleepy atmosphere. It is still however an important port and distributing centre for the eastern Hadhramaut, including Kathiri territory. About 32,000 camels a year leave for the interior. Morning and evening the beach presents a remarkable sight, for Shihr is the centre of the fish-drying industry and hundreds of large fish, principally *Caranx*, are daily brought to the shore. Shihr also has a reputation for the dyeing and weaving of cloth. The town is dominated by a pleasant old palace, of which the comfort was indeed welcome. We had several expeditions in the neighbourhood; perhaps the most interesting was to Tubala, nearly 7 miles away, whence the water supply of Shihr is brought in an aqueduct. Tubala is situated on a small green hill covered with cultivation and date palms. The hill is literally oozing with hot springs, most of them sulphurous. Its gardens were full of *bedam* trees, bananas, and tobacco.

We drove the 42 miles back to Mukalla along the hard sandy beach, scattering regiments of large yellow crabs and sea birds, and were glad enough to see again the comfortable guest-house where we stayed a week before a ship came and brought us back to Aden on New Year's Day, 1935.

NOTE ON THE CONSTRUCTION OF THE MAP

The map is reduced from the traverse of Mr. Ingrams, which was plotted on the scale of 1 inch to the mile in 12 sheets by Sapper A. H. Lock, R.E. The traverse was made with watch, liquid prismatic compass of service pattern, and aneroid barometer, with occasional use of Abney level and the Barr and Stroud infantry pattern range-finder. The distances from Mukalla to Tila as Sufla and from Henin to Husn as Sufeira made by car were measured by the speedometer. The caravan rates for donkeys and camels were determined by timing over measured distances and making allowance for the variety of the ground. The compass was checked at Shibam by alignment with the Pole Star and found correct. The aneroid was set to sea-level at Mukalla.

The traverse was adjusted to points on Von Wissman's map and to the Admiralty Chart position of Seihut; it closed on the latter with an error of less than 4 miles in 200. Certain detail has been taken from the maps of Von Wissman and of Flight-Lieutenant Rickards. Names have been spelled as far as possible on the R.G.S. II system with some local modifications used by Colonel Lake in his pamphlet on the Transliteration of the Chief Place Names in South-West Arabia. In accordance with the general practice of the *Journal* the long marks over vowels in Arabic names have not been printed in the text, but they are written in the map.

ROMAN ARCHAEOLOGY

THE AQUEDUCTS OF ANCIENT ROME. By THOMAS ASHBY. Edited by I. A. RICHMOND. *Oxford: Clarendon Press*, 1935. 10×6 *inches;* xiv+342 *pages; illustrations, maps, and plans.* 63*s*

THOMAS ASHBY regarded his book on the aqueducts of ancient Rome (which had occupied him for nearly thirty years) as his life's work. The greater part of the manuscript was sent to the publishers three weeks before his death. It is curious that his labours thus narrowly escaped the fate which has dogged similar undertakings in the past: comprehensive treatises on the aqueducts were planned by Holste and by Fabretti in the seventeenth and Revillas in the eighteenth century, but all three died before completing them. Ashby's description was ready for press, but the introductory matter containing all his general conclusions was in a state of chaos from constant revision and the insertion of additional notes and references. His friend and former pupil, Mr. I. A. Richmond, has rearranged this material and, in collaboration with Mrs. Ashby, edited the whole; but though great credit is due to him for the way in which he has carried out a difficult task, the book remains Ashby's, and in accordance with Ashby's wish, is dedicated to Lanciani.

The first part of the book consists of four chapters on general subjects—the making and preservation of the aqueducts in Roman times, the staff of the Imperial Water Board, the career and work of Frontinus, and the engineering of the aqueducts. The second part is a detailed description of the existing remains and all that can be learnt about them. The eleven main aqueducts are taken in chronological order of their construction, from Appia (312 B.C.) to Alexandriana (A.D. 222–235). Each account starts with all the information available from ancient writers as to the construction and uses of the aqueduct and its subsequent repairs, additions, and alterations. This section naturally consists mainly of extracts from the 'De Aquae Ductu' of Frontinus, except of course for Trajana and Alexandriana, which are later than his time; but it is safe to say that no scrap of information has escaped Dr. Ashby. There follows a detailed study of the remains now existing or recorded by competent authorities, from the source to the termination in the present city or in the Campagna. The identification of disconnected parts has been aided by the complete levelling carried out by the Engineering School in Rome and the dating of repairs by the work of Miss van Dieman on structural technique. She and Dr. Ashby worked together for several years, and her book, 'The Building of the Roman Aqueducts,' was published by the Carnegie Institute in 1934; it is complementary to the present volume, and in her preface Miss van Dieman writes, "It is with keen regret that this book is given to the public without its companion work, which, owing to the tragic death of the author, has been unavoidably delayed in the press." These complete descriptions are well illustrated by forty-two photographs, more than thirty architectural drawings by the late F. G. Newton, and seven maps drawn by the Istituto Geografico Militare; these maps are on folders at the end of the book and, in addition to the courses, indicate the parts raised on arches, the tunnels with their shafts, and the boundary-stones or Cippi; they therefore owe much of their completeness to Ashby's researches and repay the debt by illustrating his book.

To those interested in the topography of ancient Rome and its visible remains the importance of this book is obvious; the aqueducts, roads, and sewers were classed together by Strabo as the most important of the city's public works; but it should appeal to a much wider public. The great cities of the present day are becoming more and more dependent on the aqueduct system for their water

supplies, and this complete study of the difficulties encountered in supplying ancient Rome with water and the methods adopted to overcome them is not without value even from the severely practical point of view. A vast quantity of water of the highest purity is nowadays used for purposes for which an inferior quality would be equally suitable. Rome used the water of Alsistina for the Naumachia and the like, and we may yet be driven to follow this example and institute public supplies of inferior water when it becomes impossible to meet the total demand with supplies sufficiently pure for drinking.

The design and construction of the aqueducts is mainly of historical interest. As far as possible the courses followed the shape of the ground, a gradient as low as 1 in 3000 being within the capacity of the surveyors; but when necessary, valleys were crossed on high arches and hills were tunnelled. Although the finest examples now existing are in provincial towns of the empire, the bridges carrying the water over low ground are naturally the most conspicuous and familiar of the remains; in fact the word "aqueduct" is commonly understood to mean a raised masonry structure carrying water. That the use of such structures implies ignorance in Roman times of the principle of the syphon is a fallacy often exposed, though never so completely as in Ashby's book. Syphons were in constant use in domestic plumbing, where a single lead or bronze pipe was sufficient. Domitian syphoned water to the Palatine Hill in a lead pipe 12 inches in diameter, but this was probably the maximum size that could be made. The construction of pipes to carry a large amount of water at appreciable pressure remained a difficulty until the introduction of cast iron.

The amount of tunnelling undertaken was considerable, and the engineering was the best that could be achieved at the period; sections cut from shaft to shaft are in practically perfect alignment, and contrast well with the results sometimes produced by contractors in the provinces. For instance, in the middle of the second century A.D. Nonnius Datus, an imperial engineer, laid out a water-tunnel for Soldae in Mauretania. After four years' work he reported that the contractors had made every possible mistake: "in each section of the tunnel they had diverged from the straight line towards the right, and, had I waited a little longer before coming, Soldae would have possessed two tunnels instead of one." Nonnius resurveyed the work and put in a connecting cross-tunnel. Such a contrast illustrates the advantage of placing the water supply of Rome under the Imperial Civil Service, instead of letting it out to contractors as in Republican times. In his full description of the organization Ashby describes Frontinus, to whom we owe most of our knowledge, as "the ideal of an efficient civil servant." Yet it was the disadvantages of the system that were the *raison d'être* of his work 'De Aquae Ductu.' This report, so fortunately preserved to us, was written in order that the new curator might have a clear understanding of the system before tackling the abuses and corruption that had grown up under his predecessors. Private consumers were assessed for water rates theoretically on the amount of water they could obtain, actually on the size of the delivery pipe, which had to be stamped by the officer in charge of the section. Such pipes being normally out of sight, opportunities for fraud either by bribing the officer or by subsequent tampering were frequently seized. Frontinus's attempts to estimate the quantity of water delivered by an aqueduct or by a private consumer's supply-pipe, when the velocity of the flow could not be measured, must be of interest to all students of the history of science.

Again, the annotated lists of all recorded officials of the water service form a valuable work of reference; most of them are known to have served in some capacity in other parts of the empire, many, including Frontinus himself, in Britain.

C. N. B.

REVIEWS

EUROPE

THE PLACE-NAMES OF WARWICKSHIRE. By J. E. B. Gover, A. Mawer, and F. M. Stenton; in collaboration with F. T. S. Houghton. (English Place-Name Society. Volume XIII. General Editors: A. Mawer and F. M. Stenton.) *Cambridge: University Press* 1936. 9×5½ *inches;* lii +410 *pages; maps.* 21*s*

The thirteenth volume of this series maintains and perhaps improves upon the high standard set by its predecessors, and has a deep interest for historian, economist, and archaeologist. It is a fact that since the Place-Name Society began its work very many people have become place-name minded: local books now often refer to the etymologies of place-names, and so get a firm base for theorizing and speculation. The editors acknowledge valuable assistance in different departments to Messrs. F. T. S. Houghton, Perkins, and W. F. S. Dugdale. The whole of the north-east of the county is bounded by Watling Street, which then runs through a northern promontory drained by the river Thame; and straight through the south-eastern region goes the Roman Fosse Way, while the Stour and the Avon largely bound the south-west. Leamington (the farm on the river Leam) and Kenilworth parishes are practically central. Watling Street and the Avon have their influence on the place-names of the county. In the district north-west of the Avon, the Woodland containing the Forest of Arden, leah or ley names are very numerous, while south-east of it, in the Feldon, tuns and cotes predominate. The north, like the Weald of Sussex, was only slowly won for habitation through centuries, by the clearing of timber and undergrowth, and is still characterized by isolated hamlets and farms; in the south villages are typical, and the indications of the open field system which originally supported them. This distinction of soil and contours governs the whole early history of Warwickshire and consequently its place-names, and is corroborated by medieval charters, though place-names do not support the theory that the distinction represents the difference between Celtic and Germanic agrarian systems. The importance of Birmingham goes back to the first settlement of the county in the sixth or early seventh century. The evidence of this volume, supported by negative archaeology, attests that the occupation of North Warwickshire by the heathen English was a lengthy process. A few names illustrate heathen beliefs and practices: *e.g.* Willey, probably holy place, Tysoe, the worship of the god Tiw on a hill, and Grimeswrosne (1201), the chain of Grim, on or near Watling Street, a name attached to Roman or pre-Roman sites. As an administrative unit Waerincwicscir begins early in the tenth century, the fortress of Warwick being built by the Mercians in 914 against the Danes. About the beginning of the twelfth were created the large divisions of the county called ship-sokes, each to supply a ship for the king's naval defence: *e.g.* Kineton, Knightlow, and Hemlingford. Pre-English names, and those mainly of streams, are few, and there is little evidence for Viking settlements west of Watling Street. S. E. W.

WITH A SPADE ON STANE STREET. By S. E. Winbolt. *London: Methuen & Co.* 1936. 9×5½ *inches;* xii+240 *pages; illustrations and maps.* 10*s* 6*d*

Stane Street was until quite recently the only well-authenticated Roman road in Sussex; long stretches of it still remain in use as public roads or farm tracks, or are clearly visible as ancient overgrown banks; a full and interesting descrip-

tion of it was published by Mr. Hilaire Belloc in 1913 ('The Stane Street'), and a more technical treatise ('The Topography of Stane Street'), by Captain W. A. Grant, R.E., in 1922. It might be thought that the road had already received sufficient attention, but this was far from the case. Field archaeology has made great progress in recent years; Belloc's account, based largely on field work of earlier years, had since been found insufficient on some difficult parts of the road and had received very critical treatment in Grant's book; modern work on other Sussex Roman roads had given detailed accounts of their routes which was lacking for Stane Street. The time was thus ripe for a new and detailed study and it is fortunate that the fruit of many years' patient work has matured at such an opportune moment.

Winbolt's book provides exactly the type of book required, and Sussex archaeologists are lucky to get such a thorough study of their principal road. A most valuable feature is a complete set of 6-inch O.S. map strips for the whole route, on which are shown all relevant details of the remains and the exact position of ascertained but hidden portions of the road and of sections cut in it for examination. There are no fewer than fifty of these strips, beside a general map and other detail plans, together with an excellent selection of plates showing typical portions of the remains, of which the frontispiece showing wooden stakes which formed the foundation of the Roman bridge at Alfoldean still standing in the waters of the Arun is one of the most striking and unusual. Publishers might well note the great addition which such a wealth of maps and pictures make to the reader's convenience in a book of this character. It is a pity however that no attempt was made to point out the features shown by the air photographs of parts of the route over the South Downs by a few indicator words in the margins, as many readers may fail to understand the points which actually show quite plainly on them.

Of the text itself it will suffice to say that the author knows the whole route intimately as the result of years of personal observation, that much of the excavation work (including that upon the two *mansiones* of Hardham and Alfoldean briefly mentioned here) is his own, that he gives us length by length a full and pleasantly varied account of the actual route, followed by details of actual work done and of hidden evidence brought to light, and that he is rarely satisfied with doubtful portions unless this evidence included actual metalling *in situ*. For details of the strict alignments on which the course of the road was based the author has had the assistance of Captain Grant, R.E., who has plotted these in upon the maps. At several points hitherto doubtful the line as marked on the O.S. maps is shown to be in error, and it is to be hoped that increasingly speedy revision will soon allow the necessary corrections to be made. The most obvious case seems to be between Watersfield and Hardham, where confusion between a roadside quarry and the actual road cutting had led the official line completely astray, whereas abundant evidence now exists upon the true alignment. Another case, of different character, occurs south of Ockley, where the official line takes the road straight across an impossibly steep-sided gill, whereas the actual deviation it took is reasonably plain on the ground. Important recent discoveries in the longest section hitherto doubtful, that between Pebble Lane, Ashtead, and Ewell, are described and make even this section now reasonably certain, an important and timely advance in view of the rapid building development in that area.

The book is excellently produced, with very useful marginal references to the map strips appropriate to each section, and there is a good index. It should be a valued guide to Stane Street for many years to come and might well be an example to encourage writers upon other similar roads. I. D. M.

AN ATLAS OF ENGLAND AND WALES. The Maps of Christopher Saxton, engraved 1574–1579. Introduction. By EDWARD LYNAM. *London: British Museum . . . Trustees* 1936. 20 × 12½ *inches;* vi *pages.* 5*s*

Of the surviving monuments of early cartography few could establish so strong a claim to facsimile reproduction by modern methods as Saxton's famous Atlas—in the forefront alike for its intrinsic importance as the first provincial atlas to be produced in any country, and for its artistic excellence. Such an undertaking could hardly have been carried through by any private organization though a good many of the separate maps have been dealt with from time to time—some in the Society's set of county map reproductions published in 1932. We must therefore be grateful to the British Museum authorities for stepping into the breach. Beginning in a quiet way a few years ago with a first instalment, they have held to their task until the whole Atlas, with the fine frontispiece portrait of Queen Elizabeth and other preliminary matter, is now available, reproduced in a style which brings it as near the original as modern skill could make it. And it is accompanied by an excellent Introduction by Mr. Lynam which permits even a tyro in such studies to obtain a proper understanding of Saxton's work, so far as is possible with the all too scanty data now available. A separate copy of this Introduction has been sent us for review, and attention must here be focussed on this, rather than on technical matters concerning the method of colour reproduction, on which one could have wished for some enlightenment. The result is certainly excellent, and though any colouring tends to hide the beauty of the engraving especially in the frontispiece, it was no doubt best to present the masterpiece in the style in which it was mostly supplied in the old days; the colouring being moreover really needed to bring out the county boundaries, particularly when two or more counties are shown on one sheet.[1]

While of course building largely on the previous researches of Sir G. Fordham and others, Mr. Lynam has made the subject his own by careful study and his notes bring out points which have not been stressed by other writers, while forming the best concise general summary of our knowledge yet supplied. By the help of such contemporary authorities as are available, coupled with the dates to be found on most of the maps, and a comparison of many copies of the Atlas in its several issues, he is able to give a most readable and fully documented account of the great undertaking from its inception to its completion in 1579. He can unfortunately tell us little of the methods employed in the survey. The rapidity of the work was incompatible with any close surveying, the basis being no doubt compass-bearings taken from Church Towers or other high points, reinforced by local inquiries, and to a certain extent by older material. Mr. Lynam thinks that Saxton carried out all the survey single-handed, meaning apparently that he had no colleague of his own calibre, for the suggestion follows immediately that assistant-surveyors may have been employed. It is no doubt correct to say that no actual measurements were made, and this being so it is not quite clear why it should be suggested that the unit of measurement throughout was the old long mile, of 2140 yards, for Mr. Lynam goes on to say it varied sadly in length, perhaps to make it correspond to the various local miles then in use.

As is known, the dates borne by the maps run from 1574 to 1579, though it is not certain when they began to be placed on the market. Mr. Lynam shows

[1] When Mr. Lynam says that the maps were all coloured by hand, he is of course merely stressing the method of colouring, for a good many uncoloured single maps still exist.

that one of the sets owned by the Museum, which seems to have originally belonged to Lord Burleigh (for it contains notes in his autograph) are really proofs sent to him from time to time in view of the interest which he took in the project. Several are in earlier states than any in the completed Atlas, and the final sheets issued in 1579 are missing. These proofs show that until 1577 Saxton's name had not been engraved on any of the maps though it was added later with (in some cases) the Royal Arms and Seckford's motto. The order of publication and the successive engravers employed are clearly set out, and some of the unsigned maps are ascribed to definite names on the ground of similarity of style or contemporary statements. It was only in 1577 that Saxton obtained an exclusive licence to sell the maps, and Mr. Lynam concludes that they were first put on the market in that year, when a special effort seems to have been made to press on with the work. A reason may be found in the publication in 1577 of Holinshed's 'Chronicles,' originally planned by Reynold Wolfe as a 'Cosmography,' to be accompanied by maps—the latter never issued, though Wolfe is said to have spent much time on them. The last map to be ready was the general map engraved by Ryther—a really original piece of work—and the complete atlas was published in 1579, being mentioned in the Stationers' Register under that year. From the descriptions of some of their bearers Mr. Lynam brings out the interesting fact that the coats of arms shown on one of the preliminary sheets were probably engraved a little later—1589–91.

The baffling variety of the paper [1] and make-up of the copies known to us can be explained by the sale of single maps as required. We know nothing of Saxton's career as a map-seller after 1579 or of the tradesmen who may have stepped in after his licence expired. Mr. Lynam accepts as plausible the suggestion made by the present reviewer that Ryther may have been responsible for the issue about 1590, which has been actually chosen as the basis of the present reproduction, partly on the score of its specially artistic colouring. Of later re-issues by Web and Lea, in which the maps suffered much by injudicious changes and additions, the first seems to have been rushed out in 1645 to compete with the 'Quartermaster's Map' for sale to the rival armies in the Civil War. Mr. Lynam leaves unsolved the question whether, as indicated by the date 1665 to be seen on some of Lea's issues, together with the change of the Royal Cypher to "C.R.," a re-issue was planned, or even begun, about that time. But the existence of Lea's title-page in two states makes it probable that even his issue originally appeared before 1599, when it was announced in the Term Catalogues.

Mr. Lynam refers briefly to the fine large map of England brought out originally in 1583, of which the Museum possesses the only known copy in its original state. Even this does not appear to have been an original *print*, as the paper almost certainly dates from the seventeenth century.

We can hardly hope for much further light on the obscurities still enveloping the life-work of Saxton, but one puzzle not perhaps beyond eventual solution is that of Saxton's part (if any) in the production of the rare map of Kent (very closely resembling his own) owned by the Society and discussed at some length by Mr. E. G. Box in *Archaeologia Cantiana* for 1926. Mr. Box's theory that this map was the one referred to by Lambarde in 1579—against which some strong arguments might be adduced—is apparently accepted by Mr. Lynam, who even speaks of it as "published by Lambarde." Surely this is not likely,

[1] Mr. Lynam refers briefly to the various watermarks seen in surviving copies of the atlas, but shows that they give no great help in establishing the order of issue. He is not quite correct in saying that all the paper is French, for that marked with the kneeling saint is certainly Italian.

for there is no certainty that the latter gave any general map in his 'Perambulation' of 1576. It is true that he had seen a map in or before 1570, which bore certain resemblances to the R.G.S. map, but they need mean no more than that the maker of this last had access to the map seen by Lambarde, or one of its type. But this is not the place to enlarge upon the question. E. H.

AN ECONOMIC GEOGRAPHY OF THE BRITISH EMPIRE. By R. OGILVIE BUCHANAN. *London: University of London Press*, 1935. $8\frac{1}{2} \times 5\frac{1}{2}$ *inches;* x+346 *pages; illustrations and maps.* 6*s*

This is a text-book of intermediate standard, written primarily to meet the needs of students preparing for such examinations as require specifically a study of the British Empire. As such it succeeds; the more so since the author realizes that a work of this nature can neither be encyclopaedic as to facts, nor lavish in description. In the main he has shown a sense of proportion in the selection of material, and it is logically arranged and clearly set forth.

Part I (one-eighth of the book only) deals with general considerations: types of climate, important primary products, communications, etc. We admit the difficulty of a further condensation of Part II, but certainly Part I requires expansion. A map should accompany the chapter on climate types, and more might be made of the *combined* effect of temperature and moisture. This chapter has the merit however of at once emphasizing the connection between climatic type and land utilization.

Part II deals with the strictly economic geography of the various countries of the Empire. The distinctive contribution of each to Imperial trade is emphasized, but might well have been summarized in statistical form, as also might have been the fundamental facts of population, and of its racial composition.

The geographical factor is indicated throughout, but critically, and with discrimination. L. R. J.

ASIA

NEWS FROM TARTARY: A Journey from Peking to Kashmir. By PETER FLEMING. *London: Jonathan Cape*, 1936. $8 \times 5\frac{1}{2}$ *inches;* 384 *pages; illustrations and route-maps.* 12*s* 6*d*

The charm of Mr. Fleming's book is that he is not a traveller by instinct. He brings to the wastes of Central Asia the unusually polished observation of a civilized Londoner: he gives an urban touch to the most deserty desert and evokes the image of a butler and tray of scrambled eggs on the shores of the Koko Nor.

This talent for unexpected gymnastic, for bridging at one stride the distances that lie between the desert and the town, might be irritating in a lesser craftsman: Mr. Fleming consummately knows his art of writing; his sentences move pleasantly; their sudden transitions are never ragged or clumsy; and images of Turkistan and Europe lie side by side on his pages in a stimulating companionship, and give a rather misleading air of every-day naturalness to a very remarkable journey: from Peking to India beyond the northern frontiers of Tibet.

A description of affairs in Sinkiang, that remote province where the machinations of Russia have played a leitmotiv for many years, is the most informative part of the book, as it was the real motive of the venture. The ordinary reader however, who looks with indifference on the politics of Central Asia, will find the book delightful on purely literary grounds. It is rare to come upon a gift of description so vivid and concise; one might quote endlessly: thumbnail etchings that stand out against wide empty horizons. "Winter—cloudless and windless—gripped the yellow land, laced here and there with silver by a frozen river.

Smoke rose with great deliberation in the sparkling air. At night footsteps fall with a curious and sullen emphasis upon the frosty ground." Or this picture of the Mongol who "sat with downcast eyes—eyes which, now childish and sullen, now uneasily evasive, seemed unsuccessfully bent on appearing inscrutable. His hands fiddled with his pipe. When he spat he spat self-consciously. Helpless, knowing from the experience of generations that he was no match for his adversary, that he was out of his depth in casuistry, the proud, pathetic Mongol, hunched in his sheepskin robe, epitomised the history of a once irresistible race."

One would like to have many more of such human sketches. The difficulty of the various languages was a barrier, and it is only here and there that intimate human contacts became possible, as with the White Russian Borodistun or the Armenian exile who read the *Weekly Times* in Khotan.

The human interest is rather in the two travellers themselves, their daily nomad life against the unfamiliar background, and the contrast between them; for Mr. Fleming rarely forgets that other world he comes from, and looks at all with the quick but detached glance of a spectator; while Kini (Mlle. Maillart) fits into the primitive frame with all the natural ease of the wanderer born. The contrast is amusingly shown when, after many months, they reach their first newspapers. "Kini said she couldn't understand my lust for news; we had got on very well without it for several months, and the news in any case was just as likely to be bad as good. I said that she was talking nonsense." Most people will agree with Mr. Fleming, but a few here and there, who enjoy the pleasures of solitude, will sympathise with Kini. All will agree that the two together made a very strong and gallant combination. F. S.

BALI AND ANGKOR, or Looking at Life and Death. By GEOFFREY GORER. *London: Michael Joseph*, 1936. $9\frac{1}{2} \times 5\frac{1}{2}$ *inches; 240 pages; illustrations and sketch-map.* 16*s*

The author of this book tells us that his "chief impetus" in writing it was an experiment, in which he was injected with Mescaline: a Mexican drug used (he states) "for religious purposes." And it seems not unreasonable to attribute to the same influence the distorted vision and curiously contradictory statements that are apparent throughout his book. The experiment was a psychological one (the author's sensations while under the drug's influence are described in meticulous detail), so it is less surprising that psychological problems rather than any geographical or other interest in the regions visited should form the "motif" of the book. Bali, Angkor, Java, Sumatra, Siam, and Malaya—to which Mr. Gorer made a three-months' "round trip"—serve only as pegs on which to hang his theories concerning art and religious mysticism: particularly a force which he calls "M.E."=Magical or Mystical Energy.

The book may be of interest to psychologists; and its writer disarms criticism to some extent by disclaiming the knowledge necessary to write a serious work. So he disposes off-hand of Java's myriad interests and entrancingly varied scenery as "dull and monotonous," having "few attractions" and "no fresh colour," to see which "four or five days is ample."

Borobodur, in Java (which many consider the most perfect Buddhist shrine in existence), is, in Mr. Gorer's eyes, "only equalled in insignificance and lack of interest by the Pyramids." As for the architectural wonders of Angkor, which have absorbed the attention of two generations of savants, they exhibit "no signs of architectural ability whatsoever"; "the Khmers were the most incompetent builders in stone whose work has survived" . . . and Mr. Gorer "dislikes naivety and incompetence, however it is manifested." He does finally relent however (feeling perhaps that he has been too harsh) to the extent of coupling Angkor

Wat with Greenwich Hospital as "the two most perfect buildings" he knows. Mr. Gorer can have had few regrets when his brief, iconoclastic trip was over.

H. W. P.

UNKNOWN KARAKORAM. By R. C. F. SCHOMBERG. *London: Martin Hopkinson*, 1936. 9×5½ *inches; 244 pages; illustrations and map.* 15*s*

Owing to the fact that much of the ground immediately beyond the Central Asian watershed has been so little visited, there is naturally considerable doubt as to the lie of the exact boundary. In the neighbourhood of Hunza this doubt is increased by the claims made both by the Mir of Hunza and the Government of Sinkiang. In actual fact, as Colonel Schomberg shows, the scanty settlements and farms of the Raskam valley, though peopled mainly by Khirgiz, are dominated by a few Shingshalis, who have been established there for some years past by the Mir of Hunza, with the definite object of emphasizing his claim. No British traveller has, I believe, been permitted to travel in the lower Shaksgam and lower Oprang since the visit of Sir Francis Younghusband in 1889, so that Colonel Schomberg was extremely fortunate in obtaining permission to cross the Shingshal pass in 1934 and to explore the Shaksgam valley upwards to the Sarpo Laggo valley, if possible.

Thanks to the Vissers' expedition of 1925, when Khan Sahib Afraz Gul made a complete map of the Shingshal valley, Colonel Schomberg was in a well-surveyed country as far as the Shingshal pass. From there onwards he had only Sir Francis Younghusband's hurriedly made reconnaissance map of the lower Shaksgam. Unfortunately his two attempts to ascend that valley were foiled by flood waters, the season being still too early in the autumn. He made however a very useful reconnaissance of the southern tributaries of the Shingshal-Braldu and of the southern Oprang river, which descends south-eastwards from the Oprang pass at the southernmost head of the Taghdumbash Pamir.

The ancient Aghil pass route to the Sarpo Laggo glacier, the Muztagh pass, and Askole is now fairly well established. Colonel Schomberg found unmistakable evidence of another disused route from the Pamirs by way of the Oprang and the Shingshal-Braldu valleys to Baltistan. He also examined the lower reaches of the extensive Braldu glacier, which he discovered. Lack of supplies prevented a more detailed exploration of this ancient route, but he has much to say of interest about it and its connection with the origin and history of the Shingshali people. When the writer of this note was in Hunza in 1913 he collected some statements about this old route, which fully corroborate the author's theories concerning it. Almost certainly it led to the head of the Nobundi Sobundi tributary of the Punmah glacier or to the great unexplored basin of the uppermost Biafo. There is a very interesting piece of exploration remaining to be done in this region.

The Mir exercises little control over the people of Shingshal and is very unwilling to allow travellers over the Shingshal pass. Courtesy and polite promises made in Baltit are therefore of very little use in distant Shaksgam. Perhaps not unnaturally the Shingshalis, like their Balti kinsmen at Askole, are loth to disclose their secret bolt-holes, which have in the past proved so useful in times of trouble. That such bolt-holes are still occasionally necessary is shown by the author when he reached the southernmost corner of the Taghdumbash Pamir, soon after a merciless raid by Andijani riff-raff. Survivors had fled into the neighbouring valleys of the Mir's dominion.

The author sums up his observations and results in some useful chapters at the end of the book, which is accompanied by a very clear and valuable map. This has a number of interesting new tributaries and place-names, in collecting

which Colonel Schomberg has taken a great deal of trouble. The names are also listed in an appendix, with their derivations and meanings. He is a little hard on and unappreciative of those who have kept our frontier maps clear of personal names, a policy with which he does not agree; but there is no doubt whatever that the general opinion of geographers and travellers is in agreement with the policy of the Survey of India authorities in this respect. A different matter is the growing need for more names in regions which are becoming opened up to explorers and mountaineers and which have no names at all, and the Survey of India has already recognized this need; but personal names will rightly be excluded in the future, as in the past. A few minor observations which do not in any way detract from the excellence of this book may perhaps be mentioned. Though the Shingshalis may perhaps refer to the lower Shaksgam river by the name "Muztagh river"—it is better to spell this Turki word with a *z* than with an *s*—it would not seem sound to discard the name "Shaksgam" in its favour. It is a curious fact that the Hunzakuts refer to the whole of the Shaksgam valley and neighbouring mountains by the Turki word *Muztagh*, "ice mountains," but since this name is used by both Baltis and Turkis for the mountains alone, it would not seem right to adopt from a non-Turki-speaking people such a name for the river. The origin of the name Shaksgam as applied to the river is not quite correctly given by Colonel Schomberg, and there is a very definite political reason for its retention.

Colonel Schomberg has already travelled widely in Chinese Central Asia, and is an outspoken writer. He has made a close study of the races in these parts, and on this his most recent expedition has added very considerably to our knowledge of the country and its people. K. M.

AFRICA

GARI GARI: The Call of the African Wilderness. By HUGO ADOLF BERNATZIK. Translated from the German by VIVIAN OGILVIE. *London: Constable & Co.*, 1936. 9×6 *inches;* xvi+138 *pages; illustrations and route-map.* 10*s* 6*d*

The difficulty of the twentieth-century explorer is to justify his journey—unless he is prepared to face the real hardships and dangers of Arctic regions or Brazilian forests he must find a country which is, for one reason or another, debarred from the menace of tourism. Such a country is the Southern Sudan. Its climate is the first barrier to the Sudan, and there are many pages in 'Gari Gari' which describe most graphically the author's sufferings in this malarial territory, where the temperature rarely falls below 100°. But another and more formidable barrier to the heart of the Sudan is the Administration, which does not welcome a stranger roaming at large. On his arrival at Khartoum Mr. Bernatzik is strongly discouraged from leaving the Nile, nevertheless he succeeds (having towed his own car up the river) in penetrating a few hundred miles into the Bahr el Ghazal and Mongalla provinces, which have now been amalgamated into the Equatorial Province. It is perhaps unfortunate that he was not encouraged to travel, as he wished, further into the interior; for Mr. Bernatzik must rank as one of the finest photographers of native life, and he could have made a worthy record of those little-known tribes, the Azande and Western Dinka.

The author, himself an anthropologist, has a sympathetic understanding of the native mind. His portrait of the Nuer is excellent. But he is a misleading historian when he writes: "The *besinger* together with the small traders engineered a rising which Egypt, through Gessi Pasha, put down with great bloodshed. . . ."

Mr. Bernatzik makes no attempt to conceal his disapproval of the civilization that is gradually being introduced by the Government and missionaries, and deplores that ". . . nearly everywhere the sheikhs strut about in European clothes. . . ." But, inconsequently, he himself rewards native dancers by distributing costumes "measured and solemnly tied by my head man. . . ."

In 'Gari Gari' the reader will find all that he expects from Central Africa—big-game hunting with camera and rifle, native dances and witchcraft, fever and tropical heat; but he will welcome most the collection of photographs, all of which are of interest, while many may rank as works of art. R. W.

IM LANDE DES GADA: Wanderungen zwischen Volkstrümmern Südabessiniens. By Ad. E. JENSEN and others. (Verlauf und Ergebnisse der XII. Deutschen Inner-Afrikanischen Forschungs-Expedition (DIAFE) 1934/35, unter Führung von Leo Frobenius. Veröffentlichung des Forschungsinstituts für Kulturmorphologie. Frankfurt a. M. 1936. Edited by Ad. E. JENSEN and HANS RHOTERT.) *Stuttgart: Strecker und Schröder* 1936. 12×8½ *inches;* xvi+608 *pages; illustrations and route-maps. M.*17

The contents of this magnificent scientific work on African native cultures falls into two distinct parts. The first, compiled by Hellmut Wohlenberg, contains a brief history of Abyssinia, an account of the voyage out and arrival of the expedition in Addis Ababa, his impressions of this last independent African native State, and a description of the journey to Darassaland together with an account of conditions there under Amharic rule. The second part is mainly the work of Doctor Ad. E. Jensen. In it he graphically describes the unique institutions of the Darassa and Konso tribes, known as the Gada and Djila systems; their curious death and burial ceremonies, and the social systems of the neighbouring tribes. There is also an interesting account of the prehistoric megaliths they discovered, and a valuable collection of native folklore.

Part I.—Under the leadership of Doctor Jensen the expedition set out in 1934–35 to study the strange native cultures of Southern Abyssinia. After a difficult journey across the central highlands they reached the scene of their researches, Darassaland, which is situated near the lakes of Abaya and Chamo in Sidamo Province.

Herr Wohlenberg commences the narrative with a survey of the history of Abyssinia, and recalls the miraculous manner in which this unique African Empire has retained its independence. He traces the origin of the Amhara to the union of the aboriginal Ethiopians with the Semitic peoples of south-western Arabia, and is of opinion that these Amharic peoples are the only Africans who have shown any real knowledge of statecraft. The Amhara people remained in eclipse until the nineteenth century, when Menelik II succeeded in reconquering the lost provinces and established Amharic might throughout Abyssinia. He found it difficult to distinguish between pure Amhara people and Galla who have become Christians and attained Amhara rank. The other so-called slave tribes are apparent everywhere, doing all the work while the Amhara ride about the country followed by bands of retainers. Most of the skilled work is carried on by Greeks, Armenians, and Arabs, but as a rule craftsmanship is despised, with the exception of that of gunsmith, a craft which carries great weight in all parts of Africa.

On obtaining permission to proceed south the expedition proceeded by motor lorry over an indifferent road, across vast plateaux and even deserts, before they reached tropical country inhabited by primitive tribes. These tribes, thanks to Amharic influence, were not unfriendly to the explorers. On reaching Irga Alem, the primitive administrative capital of the Province, they

were obliged to request fresh permission before proceeding to Darassaland. The road now became a mere native track passing through a veritable Garden of Eden filled with rare exotic plants, gorgeous birds, and all kinds of animal life. Already they saw signs of the weird phallic culture which appears to be the social basis of most of the tribes who inhabit this Abyssinian lake district. Here Herr Wohlenberg's narrative draws to a close.

Part II.—Having reached Darassaland, Dr. Jensen proceeded to make an exhaustive scientific research into the cultures of the Darassa and neighbouring tribes. He says that the system known as "Gada" is the entire basis of the Darassa Constitution, and is, in effect, an aristocratic republican institution in which the tribal chief must be a fully qualified Gada who is elected as President for a period of ten years. In Darassaland everything centres round the Gada Festival "Barra Gada," which takes place every ten years. During this festival the men assemble in a large meeting house ornamented with phallic symbols which stands on the summit of Kubi, the sacred mountain, where they commune with the great spirit Daurahella. The ceremonies are presided over by the Chief Gada, who has supreme power over all members, and who conducts the sacrifices of oxen or goats. Candidates for Gada rank must kill an animal before entry, and a more ferocious animal before the next festival, they must never show signs of pain, and, during the festival, they may only see their wives in daytime. On election to the Order, they must shave their heads and refrain from cutting their hair again as it is arranged differently for each grade. Dr. Jensen ascertained that the institution is divided into three classes: Old Age Class or Generation Succession, Social Order of Rank, and Provincial Tribes under Partition. Admission to the institution makes a Darassa a Gada and distinguishes him from those who are not of Gada rank. A Gada, if he lives long enough, may go through seven stages of promotion, each stage being a ten-year period. The eldest son of a Gada is automatically a member and is highly respected regardless of his youth and inexperience. Entry to the first stage (Lumassa) is secured from the social status of the father, and at the next festival the member rises to the second stage (Raba). The third stage (Luba) is the most important, for from this rank the tribal officials are chosen and all other members become subservient to them; also during this stage circumcision takes place and entitles the member to carry a rod of phallic design. The fourth stage (Juba) is an old age grade and its members are very highly respected. The fifth stage is the last of importance, for a member who reaches it attains the highest rank possible, that of Chief Gada, and he is entitled to wear the sacred phallus on his forehead. Should a Darassa reach the sixth stage he is liable to dismissal, as the seventh and last stage constitutes the ceremony of expulsion from the Order. The Chief Gada is highly respected by the tribe, but his rank does not carry any political power. All political decisions are taken at a mass meeting of the tribe at which the Chief Gada presides, but all real power is vested in the members of the third (Luba) grade who are men of from thirty-five to forty-five years of age.

Dr. Jensen now compares this procedure with that of the Konso tribe. The Konso social system, known as Djila, has several marked differences, the most noticeable being the almost complete absence of circumcision. Only one member of the Djila system is circumcised, and he is compelled to wear female clothing for the rest of his life. Actually this system is more of a marriage caste institution. Every eighteen years a festival takes place in a sacred clearing ornamented with phallic symbols. The rules lay down that no Konso youth may marry until he has attended this feast, and before doing so he must kill an animal, for failure to do so may cause him to wait another eighteen years before he becomes

a member. Dreadful penalties are meted out to women who cohabit with non-members of this Institution. The author noted that, as in Darassaland, the third stage is the most important, for from it they select their tribal officials. Dr. Jensen also made the curious discovery that the Konso women have a similar institution of their own. In this Institution they are forbidden, during their festival, to have intercourse with men, they live together in a sacred hut, they shave off all their hair, and perform many curious rites.

The political system of the Konso tribes is distinctly monarchist. Their *bambale* or chief can only be one who is entitled to wear the sacred phallus on his forehead, and he appears to have much more power than the Chief Gada of the Darassa.

Dr. Jensen then describes the death and burial ceremonies of the Darassa, Konso, Gudji, and neighbouring tribes. He says that the bodies of chiefs are preserved by a primitive process of embalming, but the bodies of lesser tribal members are either wrapped in cowhide or numbers of blankets, the number denoting social status before burial. The men wound themselves and the women scratch their faces as a sign of mourning. Darassa graves, usually selected before death, are some distance from the villages, but those of the Konso are often in the villages. At the funerals mourners bring stones and pile these on the graves in the form of cairns. Both Darassa and Konso graves are ornamented with wooden figures which are carved by an artist who must be intoxicated. After the funerals the tribesmen dance for many days, often with curious bird-like posturings.

Later the explorers made many researches among the vast fields of pre-historic megalithic remains which lie scattered about these southern provinces of Abyssinia. These megaliths are of phallic design, and are usually found in groups or as lone pillars, often buried in the jungle. The larger monuments are of granite or basalt and, as there is no similar stone in the vicinity, these must have been transported from great distances. Some of the pillars measured 18 feet in length and 7 feet in circumference. They also found numbers of pumice stone stele of from 3 to 6 feet in height and carved to represent human faces of a bird-like type. The faces on some of these stele greatly resemble those of the present-day natives of the Sudan. Excavation proved that the stele are tombstones, but no human remains could be found under the larger phallic pillars. The natives informed the explorers that these monuments were set up by spirits and they seemed very perturbed when these were excavated and photographed, nevertheless, the explorers came across pillars which had been recently greased and garlanded. The author considers their discoveries of very great importance, for they raise fresh problems regarding the origin of these cults and their connection with similar cults in other parts of the world as far afield as Melanesia.

In addition to these valuable researches Dr. Jensen and Herr Wohlenberg have recorded a fine collection of native folklore. The artist of the expedition, Alfred Bayrle, has made many beautiful sketches of the country and its curiosities; and the photographs, with which the work is profusely illustrated, are excellent. W. F. deV. S.

NORTH AMERICA

EARLY EXPLORATIONS AND MISSION ESTABLISHMENTS IN TEXAS. By EDWARD W. HEUSINGER. *San Antonio, Texas: The Naylor Company*, 1936. $9^{1}/_{2} \times 6$ *inches;* xvi + 222 *pages; illustrations, maps, and plans.* $2.50

This book first describes in outline the work of the early Spanish explorers of

Texas, Pineda, de Vaca, Coronado, and de Soto; and then proceeds to give a detailed account of the establishment of missions in this area. The first mission in Texas was founded in 1690, the last in 1793, and soon after this date the missions were secularized. The history of these missions is clearly described, but, as not much emphasis is laid on the geographical background, the work is of greater value to a historian than a geographer. The author has based his research on many manuscript as well as secondary sources, which are set out in the bibliography. The book contains some interesting plans and illustrations of the mission buildings as well as a map of the distribution of missions in Texas. The appendices, which include a chronological summary of the twenty-five missions, eight *presidios* and two *asistencias*, a list of the Governors from 1691–1800, population tables, and a descriptive list of the Indian tribes found in Texas, will all be found useful by the reader. E. W. G.

PHYSICAL AND BIOLOGICAL GEOGRAPHY

GEOGRAPHY: An Introduction to Human Ecology. By C. LANGDON WHITE and GEORGE T. RENNER. (The Century Earth Science Series. Edited by KIRTLEY F. MATHER.) *New York—London: D. Appleton-Century Co.* 1936. 9×6 *inches;* x+790 *pages; illustrations and maps.* 16*s*

An examination of a series of manuals and text-books written for the serious student by English University teachers would lead us to the conclusion that to be sound is to be dull. Perhaps Professor Lancelot Hogben's just-published 'Mathematics for the Million' is a portent heralding a new era of real as opposed to merely academic learning, but meanwhile, University geographers, at any rate, must continue to add an American text-book or two to their recommended reading lists. "Texas is the largest cotton-growing State in America" the student reads in his English book; it is the American writer who shows him the stooping gang of negro pickers, the old fertiliser bags hanging from their waists to receive the linters. "In the south is a region of heavily timbered infertile sandy soils," writes the one, while the other conjures up a picture of squalid shacks, and small unkempt fields set against a dark background of pine trees. In sum, the English writer gives us a mass of reliable facts and figures linked by careful reasoning: the American attempts to give us life as it is lived on the Earth's surface.

This 'Geography' of Dr. White and Dr. Renner must certainly go on the reading list, and yet in spite of its carefully organized chapters and sections and sub-sections, it is often as inchoate and contradictory as life itself. Side by side in footnotes on pp. 4 and 5 respectively are the following statements: "The natural environment should be looked upon as a mould into which the human race has been poured"; and "Few modern geographers hold to the *control* concept." Yet what could control more rigidly than a mould? How can the first footnote be reconciled to the author's definition of Geography, namely, "Human Ecology, or man's adjustment to his natural environment"? Of course it is possible to argue that wax poured into a mould "shapes itself" to its new surroundings rather than "is shaped," but this is to juggle with words, and our suspicions as to the whole-heartedness with which the authors have cast geographical determinism behind them are hardly lulled when we read on p. 439: "Throughout history rich soils have bred aristocracies, whereas poor ones have cradled democracy." Let the historian answer, or the scientific farmer who will tell you that a soil is what you make it. The faulty logic which leads to such generalizations is exemplified in this very section of the book,

which deals with "social ecology" in relation to the edaphic factor. "Soil type (it is stated) may actually exercise an ecological control over the racial composition of an area." How is this? In King County, Washington, the grey-brown soils of the uplands are farmed by Americans and Scandinavians, the alluvial bottom soils by Japanese. And the reason is given, namely that the white farmers are unwilling to spend so much labour as their competitors from the Far East. But this is not soil control, the operative factor is the farmers' standard of comfort, partly individual, partly derived from his social inheritance. There could be no better illustration of the point insisted upon by Febvre, that between man and his environment there is always interposed the "idea."

But if we are compelled to impugn the philosophy of geography which informs this work, and if we shrink in distaste from a nomenclature which includes such words as besticultural, nemoricultural, saxicultural, geomatic, ecesis, unknown to our English dictionaries, we are yet anxious to do justice to a finely produced and lavishly illustrated text-book which is up-to-the-minute in its material and sources and in its awareness of current problems. One by one the physical and biotic factors that help to explain the pattern of the "cultural landscape" are held in review, and man is never lost sight of. The student is not likely to forget Fig. 150 which shows a completely clothed bull being taken across a fly-belt, or Fig. 151 which shows a man and his mount veiled against Arctic mosquitoes. A striking picture is that of the subaqueous oil-wells in Lake Maracaibo (Fig. 250), and an intriguing one that of the spot declared to be the best location in the United States for the manufacture of aeroplanes (Fig. 311). We can therefore extend a warm welcome to a college geography (to use an American term) which passes with flying colours the test of educational validity that its authors propose. Up to one hundred per cent. indeed it "smacks of life."

E. G. R. T.

THE NATION'S WATER SUPPLY. By R. C. S. WALTERS. *London: Ivor Nicholson and Watson*, 1936. 9×6 *inches;* xvi+244 *pages; illustrations, maps in colour* (4 *in pocket at end*), *and diagrams.* 31*s* 6*d*

The title of this excellent treatise has need of one important qualification. Water undertakers and associations are unfortunately in the habit of assuming that there can only be one object and purpose for water, viz. that of supplying the domestic needs of populations in cities, towns, and villages. They ignore the various other uses to which it is put in commerce and industry, in the development of power, the generation of electricity, the irrigation of land, the promotion of inland navigation and the conservation of fisheries. Mr. Walters' book relates to water resources and supplies for domestic purposes, and within that purview it is a very thorough and comprehensive account "not too technical and not too ephemeral" for the layman who has to do with, or is interested in, problems of water supply.

The volume consists of eight parts or sections. The first deals with rainfall, the second with geology, both in relation to water supply. The third discusses the quality of water, distinguishing upland from underground sources of supply. The next three sections review the actual resources, as distributed in upland areas, in underground strata and in rivers. In Part VII there is a statement of the legal position and of legislative enactments. Lastly, in Part VIII, the engineering features of domestic water supply are briefly described.

The principal primary source of all fresh water is rainfall. There may be subterranean stores of what is designated "connate" water, but, for all practical purposes, rainfall is the sole source from which domestic needs are met, and in estimating the amount and availability of these supplies, engineers in this country

have been accustomed to rely on records and gaugings of rainfall. Since however a very variable, but appreciable, part of the rainfall is lost by evaporation in the air and by absorption in the soil, there is an element of conjecture and uncertainty about these calculations; in America, the more direct method of gauging the actual amount of "run-off" in rivers and streams from which supplies are obtained is preferred. There can be little doubt as to the greater exactitude of this method, towards which however Mr. Walters adopts a rather cold and unsympathetic attitude. He says, "In Britain, rightly or wrongly, the Government incurs little expenditure on measuring the flows of rivers: there appears to be no immediate and profitable returns in so doing." He refers, rather casually, to the excellent river measurement work carried on by the Thames Conservancy at Teddington, by Professor Dixon on the Severn, and by Captain McClean on certain Scottish rivers, but, while admitting that the information contained in a complete balance sheet of rainfall and run-off is "vital," rather discounts the admission by asserting that it "would probably only be of general use for other valleys which had not been developed" (p. 17). It is unfortunate that the work of Captain McClean in connection with the establishment of River Flow Records, which he has carried on for a number of years entirely at his own expense, does not obtain more recognition.

There are several other topics of controversial interest in the book. One is the use of the divining rod. Mr. Walters is non-committal, but quotes with apparent approval the report of a committee that the method "is not sufficiently definite and trustworthy to be of much practical value," a conclusion with which most unbiased observers will agree. Another is compensation water: here again Mr. Walters is guarded in his outlook, and after stating the recommendation of the Advisory Committee of the Ministry of Health, that compensation water should be assessed on the basis of the "characteristic" flow of the stream and "user," admits that much depends on individual circumstances and that it is not possible to lay down hard-and-fast rules.

Whatever grounds there may be for occasional criticism on questions of outlook, it will be generally agreed that the book is a valuable compilation of facts and principles underlying the problem of domestic water supply in this country, and Mr. Walters is to be complimented on his success. There are some excellent coloured maps (especially the large folders in the pocket of the cover) and diagrams (coloured and plain), a number of interesting photographs, and an effective index.

B. C.

DAS MEER IN VOLKSTÜMLICHEN DARSTELLUNGEN, Band 3. Tiefseebuch: ein Querschnitt durch die neuere Tiefseeforschung in Beiträgen von C. W. Correns, A. Defant, F. Gessner, W. Stahlberg, O. v. Schubert, H. Wattenberg, G. Wüst. *Berlin: Verlag von E. S. Mittler & Sohn* 1934. 8×5 *inches; 144 pages; illustrations and maps*

Books on oceanography are sufficiently rare to make any contribution to the subject welcome, and particularly a work written for lay readers by authorities of exceptional competence. The book is a symposium of seven essays which deal with such varied aspects of the science as oceanic circulation, animal life in the ocean depths, the foods available for it, the nature of the sea-bottom, and the methods and instruments employed in deep-sea investigations. The ideas receiving treatment in these essays are however suggested almost exclusively by a study of the Atlantic Ocean and, as is noted in the foreword, with especial reference to the German point of view. Indeed the book reflects rather markedly the outlook on oceanography of the contemporary school at the Institut für Meereskunde. Four of the seven authors participated in the work of the *Meteor*

Expedition. While the critical reader may be interested in a glimpse of German oceanography as seen through the eyes of this school, the majority would probably have preferred a less restricted treatment of the science. Thus the opening chapter dealing with Germany's part in the history of oceanographical research would have been strengthened if some reference had been made, however briefly, to the work of other nations, upon which much of the German work has necessarily hinged. As it is, the work of the *Michael Sars* and the *Dana*, and the Discovery Investigations, are all but ignored and the results of marine biological stations on both eastern and western seaboards of the Atlantic and at Bermuda in mid-ocean are almost passed over. Again, in chapter III, in which the estimation of current velocity by indirect methods receives treatment, results of now classical investigations in the Antarctic intermediate layer published in this country in 1931 escape mention. The matter is therefore less ambitious than the title, but such omissions do not seriously detract from the excellent positive qualities of the book. It is well got up and copiously illustrated with text-figures and sixteen plates. Among misprints, four occurring in generic and specific names (Plates IX and XI, and p. 97) should not have been allowed to pass. E. R. G.

CARTOGRAPHY

EINFÜHRUNG IN DIE LUFT- UND ERDBILDMESSUNG. By K. SCHWIDEFSKY. *Leipzig: B. G. Teubner*, 1936. $8\frac{1}{2} \times 6$ *inches;* iv + 110 *pages; maps and diagrams. M.*5.60 (*Ausland: M.*4.20)

Dr. Schwidefsky, who has already done a valuable service to the science of photographic survey with his monograph on rectification, publishes in this book a short introduction to the subject as a whole. Hitherto there has been nothing between the treatises on photogrammetry, now available in several languages, and the various summaries of the subject contained in general survey text-books. But, as the author properly remarks in the introduction, no one who has anything to do with maps or survey can afford to disregard photogrammetry: the subject is the concern not only of surveyors, but also of engineers, soldiers and all who deal with photographs taken from aircraft. The book really enables any one educated in general survey to form a proper estimate of the value of photographic methods. There is no bias in favour of instruments on the whole or those of any especial firm in particular. The limitations of the method are always kept in sight, and much of the mathematical ballast of other books discarded. For, as he quotes, possibly from one of Professor Lacmann's lectures, "Photogrammetry is the art of avoiding computation."

The seven chapters of the book deal with theory, terrestrial surveys, air photography, simple methods from air photographs, rectification, and finally the mechanical stereoscopic plotters: a well-tempered balance for an introduction. Mention must be made of the excellent illustrations and diagrams, for the most part new, which include an anaglyph pair, complete with red-green spectacles, as well as a typical terrestrial pair and a typical air pair for inspection with a pocket stereoscope. The anaglyph is not very well chosen, because the base is too long for easy stereoscopic appreciation by those who are not expert. But the terrestrial pair of Nanga Parbat recalled the surveyor's troubles in the Himalaya. One can see so well that the first picture was taken early in the day, and that although the second was exposed as soon as possible afterwards, the clouds had already begun to huddle in every lee the mountain offered. Nevertheless we know that only the methods of survey of this book would have given us Professor Finsterwalder's map. M. A. S.

CONFERENCE OF EMPIRE SURVEY OFFICERS, 1935. Report of Proceedings. Issued by the Colonial Office. (Colonial No. 111.) *London: H.M.S.O.* 1936. $10\frac{1}{2} \times 7$ *inches;* vi + 378 *pages; illustrations and maps.* £1

The most readable literature of science is written when a scientist describes how he goes about his business. The thirty-nine papers contributed to the Empire Surveyors' Conference are almost all of this type; in only one or two cases has the obsolescent tradition that official reports should be obscure spoiled the reviewer's pleasure in reading through the proceedings of a conference at which it would have been a pleasure to be present. One thing is however clear from the discussions, that the delegates were pressed to deal with several papers at a sitting, so that many papers are not adequately discussed and many promising discussions cut short by the chairman. This we feel to be a misfortune which could be corrected at another conference by disposing of some of the less controversial and more informative papers to the *Empire Survey Review*, leaving more time to the discussion of survey matters in which different departments are each working along individual lines.

The order of the papers is haphazard, but a classification can be made into those dealing with principal triangulation or geodetic matters (13), air survey (7), cadaster and town-planning (5), cartography (4), administration (3), hydrography (2) and less classifiable papers (5). In the first division Captain Calder Wood summarises the methods of observing for primary triangulation; Captain Willis opens an interesting discussion of indestructible survey marks; Major Brown another on wireless time-signals and apparatus; Mr. Le Ray describes the triangulation of Palestine; Mr. Clendinning gives some account of the effect of temperature on field measures; and Messrs. Churchill and Morley on observing in haze. These are the papers which seemed to the reviewer to be the most interesting and suitable for discussion at a conference; some of the others were more in the nature of lectures or reports.

That there should be so many papers about air surveys indicates the ever-increasing use of the camera, not only in map-making but also in activities included in the broader implications of the word "survey." In Canada and India air survey is active; in South Africa private companies have operated and considerable interest is shown in methods. The value of a conference is here very evident, for in each dominion or colony conditions differ; not only do country and climate vary, but also the type of map required, the relations with the military air forces, and the organization of the survey departments. For instance it might be possible for one such department to spread expenditure irregularly over a three or four year period and undertake an air survey technique impossible for a department unable to spend in any year more than that year's allowance of money.

There is now no question of the excellence of the picture triangulation or Arundel method for fixing plan positions, so long as fairly large aircraft and good pilots are available; with gyro stabilized aircraft results are naturally more certain, provided the stabilizer works. The 1-inch scale is about the optimum for this method of survey; for larger scales more rigid standards of accuracy are required than draughtsmen can be expected to produce by this technique. For smaller scales no suitable camera is yet available, and the method is of course not applicable to obliques. The ground control is made more or less dense by the responsible departments according to the circumstances and the accuracy required. To make up for lack of ground control with photostrips flown at right angles to the main flying strips does not seem to be as helpful a method as it was expected to be. Nor is the situation with regard to contoured maps so very satisfactory. To contour with the parallactic grid requires fairly dense

height control, and attempts to compute heights from obliques, while valuable for small surveys, are too tiresome for regular mapping.

Gunners must have good heights and the mechanical solution by stereoscopy is the easiest way of preparing them. The argument applies equally, if not more strongly, to regular survey. Mr. Thompson, of the Geographical Section, General Staff, shows ingenuity and resource in explaining his machine, now under construction by a British firm. The fundamental ideas are for once shown not to be complex; the complications arise in the elaboration of essentially simple principles. Curiously enough the mechanical solution seems to cost much the same—about £3500—by whatever devices it is achieved. Mr. Thompson's machine differs from the continental models in that the air-base is not resolved into its components with respect to a system of ground coordinates. The implications of this difference are not discussed, nor could they be discussed with advantage before the machine has been used on strips without control.

Cadastral maps vary so much in purpose and method and yet occupy so much of the time of Empire surveyors that they seem to be represented disproportionately little in these papers. But the importance of the collection and study of cadastral maps and records organized by Sir Ernest Dowson and Mr. Sheppard corrects this numerical inferiority. The maps were at first housed by the Royal Geographical Society. During the four years since the collection was started it has been widely consulted by visitors, many of whom have supplied written memoranda. Out of a total of some 83 systems of cadastral survey the collection is documented on 45 with regard to maps, on 23 with regard to registers and regulations, and on 40 in regard to relevant legislation. A valuable discussion on this report was cut short through overcrowding of work and again one of the chief opportunities of such a conference allowed to slip by.

The cartographic papers are on map-printing, aeronautical and aviation maps, and map copyright. All are interesting. Of the unclassified papers the most important is one by Professor Pollard (University of London) on the application of kinematic design to theodolites. No definition of this curious phrase is given in the paper, but apparently it is fundamentally a restatement of the fact that a three-legged table will be steadier than one with four or more legs, coupled with recognition of complications caused by forces due to a liquid meniscus in a lubricant. The conventional theodolite axis of two concentric cylinders does not conform with kinematic principles; it is well known that in recent years some superbly manufactured instruments have given poor results due to neglect of these principles in design. Some bold and important modifications have been made by Rannie and Dennis in Canada to the Wild instruments, but these were only an approach to correct kinematic principles. Professor Pollard gives drawings of a correctly designed theodolite and a specification of the materials to be used in its construction. But it will doubtless be many years before any manufacturer leaves the accepted machine-tool principles of design for a theodolite. Both the paper and the discussion deserve serious attention.

The *Empire Survey Review* was discussed at the conference and properly appreciated. Many delegates had nevertheless found the contents "highbrow and highly technical," and wished for a greater proportion of "chatty" material. The contrast seems an unfortunate one as the facetious material occasionally published has hitherto not been such as to enhance either the readability or the reputation of the journal. The proper opposition is between theoretical matter, such as formulae for converting co-ordinates, and practical matter such as the majority of the papers given to the conference. It would be surprising if a

surveyor could write witty English or make entertaining drawings, for such abilities lead to more profitable professions. But a first-hand description of work done is always worth reading. No one mentioned the shocking cover design of the *Empire Survey Review*.

Finally the conference as a body passed certain important resolutions. The first called for a central pool of those survey instruments such as geodetic apparatus, usually very expensive but essential to serious survey though not in continuous use. The second expressed confidence in the *Empire Survey Review*. The third urged the necessity of a proper geodetic survey of Australia as a foundation for all later surveys. The fourth appreciated the value of the conference itself and thus expressed an opinion which these papers show to be indisputable. M. A. S.

ECONOMIC AND HISTORICAL GEOGRAPHY

THE GREATNESS AND DECLINE OF THE CELTS. By the late HENRI HUBERT. (The History of Civilization. Edited by C K. OGDEN.) *London: Kegan Paul, Trench, Trubner & Co.* 1934. 9½×6 *inches;* xvi+314 *pages; sketch-maps.* 16*s*

The Collection de Synthèse Historique, whose editor is Professor Henri Berr, an eminent French historian, is of the greatest interest to geographers. Curiously enough, it seems as if the authors, the editors, even the reviewers, had not perceived the geographical aspect of these books: they fully acknowledge the historical work of the scholars, their archaeological, philological or anthropological research work; but they never mention their geographical work. In Hubert's book the geographical part is most important and excellent: so much so that Professor Vendryès, a linguist, has quoted the description of the Champagne in La Tène period and "the fine picture of Celtic Gaul," both essentially geographical, as "masterpieces, ready for future anthologies."

Hubert's first volume begins with a general introduction which is almost purely geographical; then comes the part dealing with anthropology. More than half the book is given up to the "Movements of the Celtic peoples," and is therefore necessarily built upon geographical foundations. The second volume is divided in three parts. The first part, entitled "Celtic expansion of the La Tène period," is a series of regional studies: Italy, Spain, Germany, Gaul. The second part, entitled "The end of the Celtic world," is also an important contribution to historical geography as well as to history. The third part, which is according to Celtic experts the best part of the book, is a wonderful picture of the origins of our Western civilization.

This is not the place to review 'The Celts' from the standpoint of Celtic erudition; but nevertheless it should be said that the late Hubert's erudition is hardly ever to be found at fault and that this important work of his, though he was unable to finish it, as he was cut off in the prime of life, has fortunately been completed in the same scientific spirit by his learned friends, Professors Marx, Lantier, and Mauss.

The English translation might have benefited more than it did from the "erratum" on the French edition published in the *Revue Celtique;* also some mistakes in the references were avoidable. These are minor faults—but every possible care should be taken to make any edition of Hubert's book very perfect, as it will be for many years to come the best classical text for the study of the history of the old Celtic peoples. Y. M. G.

ASIA: A Regional and Economic Geography. By L. DUDLEY STAMP. *London: Methuen & Co.*, 1936. (Third Edition.) 9×5½ *inches;* xxii+704 *pages; maps and diagrams.* 27*s* 6*d*

The first edition of this volume appeared in 1929, and now, seven years later, appears the third edition enlarged by 84 pages and 30 diagrams. Dr. Stamp has to some extent improved the balance of the work, which is the standard reference volume on Asia produced in England, by allowing the large chapter on the Indian Empire to stand and extending the chapters on the Far East by a third. The increase is to be greatly commended as, while mere length is no criterion, it does help to restore the balance of the treatment and thus help to nullify some of the more serious criticisms levelled against the first edition. The increase of knowledge of the more recently exploited parts of the Far East as Manchoukuo, given the old name of Manchuria by Dr. Stamp, has been incorporated in this new edition, as have the research investigations of American and Oriental scholars on topics connected with Pacific lands. Thornthwaite's climatic regions have been placed against those of Köppen, although unfortunately the two diagrams do not face each other, and it is seen how difficult it is to propound rule of thumb, or mathematical, climatic classifications that really mean something in the field. Dr. Stamp has incorporated a large amount of statistical investigation into the volume, and this has in many cases been summarized in the form of simple diagrams—so simple in some cases that one feels that they could have been expressed in words or in more instructive diagrams. A case in point is the diagram on p. 254, that shows the exports of India as a percentage of the total trade. A diagram, Chart XVI, in *Journal* No. 4362, of the Royal Society of Arts, expresses the swing of the trade far more vividly, although it must be granted that it has been prepared for a more detailed text than Dr. Stamp's, which is concerned with the whole continent. Another example is Fig. 211, where the varying of the area of the circles proportionally to the world's total rubber production and the shading of non-British and non-Dutch rubber production would have made the diagrams more useful to the student. The maps in the volume are as a rule bold and clear, although in a few cases, as Fig. 161, the stipples and names mutually interfere. In the eyes of the reviewer the use of solid black for high altitudes is to be deprecated, as leading to over-emphasis of negative areas and being too dazzling to the visual impression which is after all the function of a diagram. The use of a multitude of symbols as in Fig. 79 is also confusing.

The book is extremely useful as a work of reference, but one feels that a more humanized treatment not so weighed down with statistical considerations would give a reader a more rounded idea of the continent. Such a treatment would, if the preservation of the existing material had been attempted, have led to a greatly increased size of the volume and made the price even higher than it is already. The author in asides, sometimes facetious, as in the case of the account of the religions of the Indian Empire, does endeavour to bring to the foreground the outlook of the native peoples. While one may prefer the essay style, with the emphasis on the major aspects of a region, it must be admitted that Dr. Stamp's itemizing of the various political units under bold headings as Geology, Climate, and Commerce is the better method for a work of reference and for students bent on acquiring a maximum of fact in a minimum of time. A. C. O.

THE MONTHLY RECORD

INDEX TO SUPPLEMENTS

An index to the lists of recent geographical literature, issued three or four times a year as Supplements to the *Geographical Journal*, was published in November. This volume forms an author and subject index to all the titles of articles in periodicals as well as of books contained in the first forty-one lists covering the period 1918 to 1932. The periodicals thus indexed comprise the important geographical publications of all countries which are accessible in the Library of the Society. Full use can be made of the Index only in conjunction with the Lists, but it should be realized by Fellows who use the Library and are unable to consult the author and subject catalogues that this volume is in effect an abridged catalogue of the contents of the Library for the period 1918–1932. It should also be found useful in other geographical libraries as a guide to the literature for the important period in the development of the subject following the end of the war.

The Index forms a volume, royal octavo, of 470 pages, priced 16 shillings, to Fellows 12 shillings, plus sixpence postage. Orders should be sent to the Office of the Society as soon as possible.

THE *JOURNAL* OF THE TYNESIDE GEOGRAPHICAL SOCIETY

We have received the first number of the *Journal* (New Series) of the Tyneside Geographical Society, a publication which, having been in abeyance for some time, is now revived in view of the jubilee of the Society next year. The number, in addition to appreciatory messages, including one from our President, contains several interesting articles. Mr. Herbert Shaw, Secretary of the Society for many years, contributes reminiscences of its history and its work in stimulating interest in geography in North-Eastern England. It is to be noted that the co-operation of the Newcastle branch of the Geographical Association and other local bodies has been secured for the furtherance of this aim. The *Journal* is to concentrate largely upon economic and other material relating to the Tyneside region; two papers in this number indicate the type of study to be expected. Miss D. Sylvester gives a brief historical survey of the "provinces" of Anglo-Saxon England, among which Northumbria was one of the best defined and most important, and points out the degree to which these retained their individual characteristics in succeeding centuries. Mr. Preston Pilbin examines the considerations which explain the distribution of the glassworks, formerly one of the leading Tyneside industries. There are many spheres in which local geographical societies can do useful work, and it is to be hoped that the Tyneside Geographical Society will prosper in its new venture.

TWO RECENT SOIL MAPS

A soil map of Germany on the scale of 1/M printed in colour with an explanatory essay by H. Stremme, forms Erganzungsheft No. 226 of *Petermanns Mitteilungen*. The various kinds of soils are classified by two systems: the first, indicated by colour, is a genetic and morphological classification, based upon the influences which have produced the various soil formations. These include the direct and apparent factors—vegetation, water, relief, rock, and human agency, and the indirect factors of climate and time. In the first type are distinguished the black and brown steppe soils, and the brown and rust-coloured forest soils; and in the humid soils the mineral and organic types. The degree of slope is also indicated for the mountain zones. The second classification is established upon a petrological basis taking into account the size of the grains and the mineral content; it is indicated by signs in black printed upon the colour. These two

classifications are related to each other, but it has been thought preferable to use the two rather than to attempt to evolve a single system. The basis of the colour scheme is the use of several shades of green for the forest soils, and violet for the steppe soils. These contrast with the colours employed for the soils more directly dependent upon the rocks: in this way the transitional character of Germany is emphasized, from the uniformity of the East European plain to the more varied types of Western and Southern Europe. The accompanying text discusses the system of classification, the composition of the soils, and the general conclusions to be drawn from the map.

The Danish Geological Survey has also issued recently a soil map of Denmark on the scale of 1 : 500,000, accompanied by a text in Danish and English by C. H. Bornebusch and K. Milthers. The surface deposits of Denmark are all of Quarternary age, consequently the soils are based upon the distribution of the Quarternary deposits. Of these there are three main types: clay, principally of morainic origin, occupying the area covered by the inland ice of the last glaciation; diluvial sand and gravel, deposited in running water in close association with the ice sheet; and heath sand, stratified extra-marginal deposits occurring as out-wash plains and river terraces. In addition, there are smaller areas of late and post-glacial marine deposits, dune areas of blown sand, and post-glacial freshwater deposits, distinguished as bogs and meadows.

The interaction of climate, vegetation, and surface deposits has produced two main soil types, the brown soil, in which the humus, or decomposed plant remains, is intimately mixed with the mineral soil, and the podsol, in which there is very little mixing, so that the humus forms a sharply defined surface layer. In Denmark, the brown soil occurs naturally in association with forests of beech and trees requiring light, with an undergrowth of bushes, or pastures with grass and herbs. The podsols range from slightly podsolized soils on plains with young heath vegetation, to very strongly podsolized soils in humid areas where a hard black pan has been developed. In general, the clay areas are less, and the sandy areas more likely to become podsolized; but in this a cold, wet climate has an important rôle. This distribution has also been much affected by ploughing and the introduction of a new vegetation cover by man. The map shows the clay and till areas, of wide extent in the south east, in brown, the diluvial sand in red, and the outwash gravel in light brown, with a number of minor types. The degree of podsolization is indicated by symbols in black.

CARTOGRAPHY OF PRUSSIA

An important contribution to the history of German cartography is formed by the 'Geschichte der Amtlichen Kartographie Brandenburg-Preussens,' by the late M. Hanke, edited by Professor H. Degner, recently published in the *Geographische Abhandlungen* (Third series, part 7). This study, which has been brought down to the close of Frederick II's reign, is concerned with the mass of cartographical material, formerly secret and largely unpublished, to be found in the military and official collections in Berlin. The text contains an historical account of the development of the surveys, of the responsible organizations, and of royal interest in it, with biographical details of the many personages concerned, into which has been interpolated bibliographical details of the manuscript and printed maps, so that it is at times difficult to find a clue to the study. From the circumstances, political and others, attending the growth of the Prussian kingdom, it is also difficult to distinguish between the military and civil work. Some of the impetus undoubtedly was derived from the interest of the Hohenzollerns in their domains, and some from land improvement, canals, drainage, and similar works, but the chief motive appears to have been the

military. Though the Thirty Years' War had stimulated interest and the earlier rulers were sympathetic, the period of great activity did not begin until the eighteenth century. Frederick William I was earnest in promoting cartographical studies, but it was to Frederick II that real advance was due. A military engineers corps was formed in 1729, but its duties were limited largely to the siting and laying-out of fortifications. Frederick II, in addition to developing a general quartermaster's staff, charged with the duty of supplying maps, was the first to insist that all military officers should be instructed in the rudiments of map-reading and field sketches. The first "official" map of Prussia was produced by Caspar Hennenberger in 1576. Later important work was done by Samuel von Suchodoletz, especially in East Prussia, and it appears that early in the eighteenth century all the provinces had been surveyed for governmental purposes. For the first time the work done for the mapping of the Prussian central provinces at the instance of Baron von der Schulenburg-Kehnert is revealed here: this formed the basis of a manuscript map covering a large portion of the country on a scale of 1 : 100,000, prepared during the years 1778 to 1786. The most important map of the period however appears to be that produced by von Schmettau, without official aid, in 270 sections, much of it on the scale of 1 : 50,000.

THE LAKES OF POTOSI

An interesting and well-illustrated article on the history and recent renovation of the Potosi canal system by Mr. W. E. Rudolph is published in the *Geographical Review* for October 1936. The output of silver from the Cerro Rico, which began to reach Spain in the second half of the sixteenth century, and profoundly affected the development of European politics, depended almost entirely upon ample supplies of water for the mills after the exhaustion of the high-grade ore. This supply was secured by an elaborate system of storage lakes and canals built during the period 1573–1621. The flank of the Karikari range, east of Potosi, is cut by a number of glacial troughs; by building up the frontal moraines or tapping the natural lakes in the cirques at their heads, the Spaniards constructed some thirty lakes from which the water was led by canals and aqueducts to the city. The "Ribera," which carried the water through Potosi, had, like the canals, walls of stone in lime mortar, was 8 metres wide and 5 kilometres in length, and had a total fall of 594 metres. The total storage capacity of these lakes is estimated to have been 6,000,000 metric tons. Some system of storage of water, apart from the requirements of the mills, was necessary for Potosi, since the greater part of the rain falls in the three summer months.

This secure supply of water, the introduction of the quicksilver amalgamation process, and the discovery of new veins raised Potosi to a height of great prosperity in the first quarter of the seventeenth century; this was shattered by the disaster of 1626, when the San Ildefonso dam burst. Seventy-nine mills were completely destroyed in the city, and about four thousand persons killed. Repairs were effected and silver continued to be mined, but the old standard was never recovered, and the system fell into increasing decay. Some of the older lakes have disappeared, and the deposition of sediments rendered others useless. In 1935 six lakes only were usable, and practically none were holding water efficiently. The tin mines, which had been at work since 1891, were thus seriously threatened. The *Compañia Unificada* accordingly undertook to re-establish the system: dams have been rebuilt, outlet valves improved, and efficient spillways provided. The Compañia has thus been able to double its daily output of ore treated, and so to revive the prosperity of Potosi. This improvementwas fortunately effected before the rainy season of 1936, when the rainfall was only 35 per cent. of the normal.

OBITUARY

SIR HENRY WELLCOME, F.R.S., LL.D.

Sir Henry Wellcome, who died in his eighty-second year on July 25, was born in Wisconsin, his early life being spent among the Dakota Indian tribes. He also took part as a boy in the Sioux Indian war. After obtaining a diploma in pharmacy at Philadelphia, he travelled extensively in North America, and also made a journey to South America to report upon the native Chincona forests. He then determined to become a manufacturing chemist in London, and in 1880, in partnership with Mr. S. M. Burroughs, founded the firm known by their names. Sir Henry was always interested in the history of medicine and in medical research, establishing a number of departments to further these studies. Since 1900 the Wellcome Tropical Research Laboratories, founded at Khartoum with the co-operation of the Sudan Government, have carried out important investigations into the endemic diseases of tropical Africa. The Historical Medical Museum, opened in London in 1913, contains exhibits illustrating the development of medicine and chemistry from the earliest times, and a library of valuable manuscripts and printed books. The Wellcome Research Institution was founded in 1931 to bring together the various laboratories, and to co-ordinate their activities. He was the friend of many well-known explorers, to whose expeditions he gave much assistance, and a keen supporter of missionary enterprise. For his public services he was knighted in 1934. He had been a Fellow of our Society since 1890, and was a generous contributor to the building fund.

MEETINGS: SESSION 1936–37

Annual General Meeting, 19 October 1936. The President, Major-General Sir Percy Cox, in the Chair.

The HON. SECRETARY (Mr. W. L. SCLATER) read the Minutes of the Annual Meeting held on 24 June 1935, which were confirmed and signed by the President.

The PRESIDENT said: My first duty this afternoon, and a very agreeable one, is to make on behalf of the Society the presentation of its Medals and Awards for the year.

His Majesty King Edward VIII has been pleased to approve of the award of the two Royal Medals as follows: *The Founder's Medal*, bearing the effigy of King William IV, to Mr. G. W. Murray, Director of Desert Surveys in Egypt; and *The Patron's Medal*, bearing the effigy of the reigning Sovereign, to Major R. E. Cheesman, until recently H.B.M. Consul at Dangila in north-west Ethiopia.

The Victoria Medal, instituted by the Society in memory of Queen Victoria for conspicuous merit in scientific research helpful to geography, and not necessarily given every year, has been awarded by the Council to Doctor Stanley Kemp, F.R.S., Director of Research to the Discovery Committee of the Colonial Office.

I will amplify those brief announcements of award by giving a few details from their record of each recipient.

Mr. G. W. Murray is Director of Desert Surveys in Egypt. In that important post he has placed to his credit a long record of valuable exploration and desert survey work, in the Sinaitic Peninsula, in Western and Eastern Egypt, and in the Red Sea Hills, southwards of the Sudan. He has climbed a number of mountain peaks within his sphere, many of them first ascents, of which he has published accounts in the *Alpine Journal*. He visited the ruins of Aidhab, a mediaeval city of some importance on the Red Sea coast which had been discovered in 1896 by Theodore Bent, and contributed an interesting account of it to our *Journal*. He has also made a thorough study, extending over many years, of the anthropology of the desert tribes whose habitats lie within the sphere of his work, and the effect of his investigation has been to demonstrate the existence of a great similarity between the eastern tribes of the present day and the pre-dynastic inhabitants of the Nile Valley. Lastly—and I should like to emphasize this aspect of his record—he has habitually afforded unstinted co-operation to expeditions operating in the sphere of his department, doing his utmost to further their plans, both officially and unofficially, in a most unselfish manner.

Mr. G. W. Murray: I wish, Sir, to thank you and the Council of the Society most sincerely and heartily for the Founder's Medal which you have just given me. It is a peculiar pleasure to be proved no prophet and to receive such a high honour among my own people and in my own country. For I was born, Mr. President, in the Royal Borough of Kensington; within, shall we say, a kilometre of this hall. When I first learned of the reward in the pleasantest manner possible—through the congratulations of colleagues—I was not a little astounded. On reflection I came round to the idea that the Society was not so much sniping at individuals but, in a general burst of fire directed at the Survey of Egypt, had succeeded in hitting the leading member, for the moment, of the Desert Survey team. If there be any truth in that, I have to thank you again in the name of those colleagues who have so gallantly pushed me into the breach and who are following up hard with the intention of becoming casualties themselves later on. So, in the name of the Survey of Egypt, I thank you for this, their third gold medal.

The President: Major R. E. Cheesman who, you may remember, received the Gill Memorial Award in 1925 for his journey to Jafura and Jibrin in the eastern hinterland of Arabia, now receives the Patron's Medal in recognition of nine years' valuable travel and survey activity undertaken while he was holding the post of Consul at Dangila in north-west Ethiopia. In 1927 he contributed a paper to the *Journal* dealing with his first reconnaissance of the Blue Nile, in the course of which he covered 400 miles in the face of great physical and topographical difficulties. In the following year he carried through a second reconnaissance covering the rest of the Blue Nile Valley. In a third journey he surveyed the route from Dangila past Lake Tana and thence northwards up to the Eritrean frontier. The War Office, it is understood, have incorporated his work in their latest maps of Abyssinia and on more than one occasion he has received the thanks of the Geographical Section for his valuable contributions. His last appearance on our platform was in February 1935, when he read a paper on "Lake Tana and its Islands," which he had thoroughly explored, and he has since published an interesting book entitled 'Lake Tana and the Blue Nile,' in which he deals more fully with the subject. But, Major Cheesman, I am not in a position actually to hand you your medal today, as I learn from the Privy Purse that your medal and others bearing the effigy of King Edward VIII are not yet ready for issue.

Major R. E. Cheesman: There would hardly be time for me at this meeting to

express my great gratitude for the award which is being conferred on me by the presentation of the Patron's Medal of the Royal Geographical Society. This is a moment which I shall treasure in my mind to the end of my life. I suppose everyone who has done survey work finds that there is always a great deal left undone. In my limited experience in Arabia and in Africa I have realized that that is true. To take only one instance: there is a rich harvest to be gleaned by the traveller in the hinterland behind the Yemen Mountains towards the great desert; not only in geography but in zoology and in ornithology. There must be relics of the old Sabean civilization and there is also the later civilization of the Abyssinians and their script.

I should like to refer to the great help and encouragement I have always received from this Society and its distinguished President. He was my chief in Baghdad and it was while I was serving there as one of his staff that I began my travels. During the absence of Sir Percy Cox when attending a conference in Cairo, at which the now flourishing Arab State of Iraq was born, I was given a month's leave. Towards the end of the month I found I could not very well finish my programme and get back in time. I managed to get a telegram sent explaining that I was curtailing my programme in order to return, and received a reply: "Remain to finish work." The High Commissioner had to manage for a fortnight without his private secretary, but as a result I was able to get the longitude and latitude of Salwa and start along the ruins of the old city.

It was many years ago that I took a course of instruction here in this building under Mr. Reeves, and there are few of his pupils who did not fall under his magic spell. I am most grateful to him and to the Society for giving me the opportunity of turning my journeys to useful account, as they would otherwise have been rather aimless travelling and wandering. I thank you again, Sir, for the great honour you have done me.

The PRESIDENT: Since 1924 Dr. Kemp has been Director of Scientific Investigations in the Antarctic, undertaken on behalf of the Government of the Falkland Islands Dependencies by the Discovery Committee of the Colonial Office. Although the primary interest of these researches has been connected with the whaling industry, Dr. Kemp seized every opportunity of surveying in the archipelagos of the southern ocean in one or other of the two research vessels belonging to the Discovery Committee, and his oceanographical work on the depths, temperatures, and currents in Antarctic waters constitutes a handsome contribution to geography as well as to whaling research.

Dr. STANLEY KEMP: I am very grateful to you, Mr. President, for the kind way in which you have spoken of our work and for this high honour which you have conferred upon me. As a matter of fact, in receiving it I feel something of a fraud because our work in the south has seldom taken us into high latitudes, and the discovery of new lands has never been our objective. It has been our fate to follow in the wake of the great explorers of the past, to study the geology and hydrography of the Southern Ocean, directing our energies to the solution of problems which are of practical account. I am glad to think that in the course of our work some surveys have been made, and I was particularly pleased to see the name of Lieutenant Nelson in your Honours List to-day.

But it must be confessed that during the greater part of our time we have rather turned the cold shoulder on geography and have courted instead her younger sister oceanography. In presenting me with the Victoria Medal I feel, Sir, that you are taking this attractive lady under your wing. I should like to think, too, that in making this award you are bestowing your approval generally on all my colleagues and shipmates, for our work is essentially team work and success in a task which often involves much discomfort and monotony is only to be attained

by the enthusiasm and the close co-operation of an entire ship's company. I am proud indeed, Sir, of this award and beg to tender you my most grateful thanks.

The PRESIDENT: The Murchison Grant is awarded to Mr. Michael Leahy for his exploration of Central New Guinea.

Fellows who heard Mr. Michael Leahy at the Special Meeting on 21 November last or have read his paper on "The Central Highlands of New Guinea" published in the *Journal* for March of this year, will remember the great interest of the territory, which has within the last few years become better known by the combined efforts of the administration and of the prospector. Mr. Leahy's business in New Guinea is that of prospector, but his lecture showed that he possesses first-class powers of observation and a real instinct for studying and describing the people and the country in which his professional interests lie. His account of the region on the borderland between Mandated New Guinea and Papua has interested anthropologists as much as geographers, and the systematic care with which he has photographed, and determined as far as possible the position from which he has photographed, would do credit to any explorer.

Mr. DANIEL LEAHY: Mr. President, on behalf of my brother I would like to thank you for this award.

The PRESIDENT: The Back Grant is given to the surveyor, Muhammad Ayub Khan, for his surveys on three expeditions under the leadership of Sir Aurel Stein in East Persia, 1931–34.

He is one of those Indian frontier men who under the instruction of the Survey of India have developed a remarkable natural talent for exploratory survey under conditions involving physical hardship and strain and which only exceptional zeal and unfailing energy can support. We are assured by Sir Aurel Stein that Muhammad Ayub Khan greatly deserves to rank among those other distinguished Indian surveyors who have in years past received similar awards of the Society.

Mr. MONTGOMERY (representing the High Commissioner for India): Mr. President, on behalf of Muhammad Ayub Khan I thank you for the great honour that has been done to him and to his country by the award of this Grant.

The PRESIDENT: The Cuthbert Peek Grant is awarded to Mr. T. H. Harrisson, to assist him in his proposed expedition to New Guinea.

Two very ample papers contributed to the *Journal* by Mr. T. H. Harrisson exhibit well his remarkable capacity to enter into the lives of the most primitive savages remaining to-day for the study of anthropologists, and the Society has been glad to learn that Mr. Harrisson, notwithstanding the arduous years which he has already spent in the New Hebrides, is now full of plans for extending his studies into some of those regions of Central New Guinea which Mr. Leahy was the first to explore. The Cuthbert Peek Grant was designed by its donor to be given rather as assistance to future exploration than as a recognition of past, and it is thus given to Mr. Harrisson in the earnest hope that he may succeed in the proposed arduous, difficult, and one may add dangerous journey, which it is his ambition to make next year.

Mr. T. H. HARRISSON: It was the work of the Leahy brothers and also of Jack Hides of Papua that made me think of going to New Guinea. I hope to get there before it is too late to obtain a record of what appears to be the last remaining trace of the Stone Age.

I should like to take this opportunity of saying how much I appreciate the honour that the Society has conferred on me in showing its confidence in me and to say how much all young people, such as myself, who are trying to do some exploration feel that in this Society, its officers and staff, we always get support

and criticism and, if we are worth it, encouragement. In many places, among the older people there is a tendency to discourage us. That is not so here, and it makes an enormous difference.

The PRESIDENT: The Gill Memorial is awarded to Lieutenant A. L. Nelson, R.N.R., for his Charts of the South Sandwich Group, South Orkneys, and South Shetlands.

Lieutenant Nelson was for many years one of the navigating and surveying staff of the vessels successively employed by the Discovery Committee to which I referred when handing the Victoria Medal to Dr. Kemp. None of the tasks of those vessels has been more important than the accurate charting of the archipelagos in the Antarctic Ocean, and no branch of the work has required more keenness and resolution than the surveys of these often magnificent islands in the stormiest ocean of the globe. I am sorry that Lieutenant Nelson is not here to receive the award, which will be conveyed to him by the Honorary Secretaries.

The PRESIDENT then delivered his Annual Address, which is printed on pp. 481–490.

Visitors having withdrawn, the PRESIDENT appointed Major-General Sir Cecil Pereira and Mr. Vaughan Cornish to act as scrutineers of the Ballot for the President and Council for the ensuing year.

The PRESIDENT, in submitting the Annual Report of the Council, said:

May I say a few words with reference to the Annual Report while the scrutineers are checking the Ballot.

The total strength of the Fellowship of the Society as the figures stood on 31 March 1936 is 6016. As you know we, like almost every society and every club, in London at any rate, have felt the effect of the general financial depression, and it has not been easy to maintain our strength at or round the 6000 figure, but there are signs of an upward trend and the "whip," if I may so call it, which I recently addressed to Fellows, has resulted in more candidates being proposed for election than we have had at the beginning of the Session for several years. Please understand that it is not a question of going to the highways and hedges for recruits; none of us would wish that, but it is, according to my experience, and much more than you would be inclined to believe, a question of overcoming a sort of inferiority complex among one's friends which makes them backward in coming forward to seek the Fellowship which they would be only too ready to enjoy. One must continually have the conditions of Fellowship in mind and be persistent, when opportunity offers, in explaining the aims and objects of the Society. Will you forgive me if I refresh your memories by reading the paragraph in our pamphlet which sets forth our aims, and the conditions of Fellowship. It is as follows:

"The object of the Society being the promotion and diffusion of geographical knowledge, it has always welcomed to its Fellowship those who are anxious to promote this object by their interest and support, as well as those able to take a more active part in the work of discovery and exploration. It is not required of a candidate for the Fellowship that he should have travelled some specified distance, as is sometimes supposed, nor that he should have published some piece of original geographical work. The strength of the Society has always been that it has brought together for the advancement of Geography the sailors and soldiers, administrators and politicians, teachers and students, who form an instructed public opinion to support the efforts of explorers and travellers, to influence the direction of survey and research, to improve scientific education, and to provide the necessary means."

The Report was then unanimously adopted by the Meeting.

Major-General Sir Cecil Pereira reported that the scrutiny of the Ballot showed that the Candidates proposed by the Council had been elected unanimously.

The PRESIDENT: I am glad that the recommendations of your Council for filling the Presidency, the Treasurership, and the vacancies in the Council have been unanimously accepted, I congratulate you on your good fortune. In my successor, Professor Henry Balfour, you have a very distinguished man of science, and a very charming one, in whose hands the interests of the Society will be quite safe. Apart from being a Fellow of the Royal Society, the blue riband of our men of science, he is a man of wide experience and interests, among them, as you know, anthropology being the chief. Nowadays in the sphere of exploration anthropology and geography naturally overlap.

When it was first suggested to me that I should allow my name to be put forward for the Presidency I expressed to an old friend on the Council considerable misgiving as to whether I had the equipment calculated to make a satis factory President. His reply, which somewhat heartened me, was: "Well, the experience of the past has been that each succeeding President brings some quality or experience to the Council Chamber which operates to the interest of the Society." I can only hope in the retrospect that that opinion has been borne out in my own case.

Turning to new members of Council they are all men of some particular attainment, which makes them each an acquisition to the Council. Sir Harcourt Butler you know very well, he has been on our Council for many years, he was obliged owing to pressure of work for the Bank of which he is a Director, to resign the office of Treasurer, but he remains a member of Council. He is succeeded by Lord Plender, a name to conjure with in the financial world, and the Society are extremely fortunate in his accepting the Treasurership, in spite of the innumerable calls on his time. As regards the other new members of Council, Lord Moyne is a member of the Privy Council, a D.S.O. for services in the War; a former Minister of State, and now a great traveller with a keen interest in anthropology. Dr. Dudley Stamp is Director of Land Utilization Survey of Great Britain; Major Bagnold, an expert in desert travel by car, who has distinguished himself especially in the Libyan Desert, and is a Medallist of the Society; Colonel Crosthwait, a former member of Council, now returns to it: he has a special interest in air survey. Mr. E. H. Keeling is a Member of Parliament, and a very keen Fellow of the Society, with wide knowledge of the Near East. Lastly there is Mr. James Scott, the companion of Gino Watkins, experienced in Polar travel and a close friend of John Rymill and his party now commencing their third year of exploration in the Antarctic. I think you will agree that they are a "live" company.

Now it remains only for me to pay grateful tribute to the Officers and Staff of the Society who have given me so much cordial co-operation in carrying out my functions during the past three years: firstly, our distinguished Secretary, very heavily worked, especially of late in the preparation for the press of the new Volume II of our 'Hints to Travellers,' but ever ready to take on some fresh task; Mr. Crone and the staff of the Library; Mr. Allen and his colleagues in the Map Room; and the skilful draughtsmen who have turned out much beautiful work. Lastly I should not forget the Hall and the House Staff, to whose courteous attention to their duties I have had several tributes.

I am also deeply appreciative of the helpful co-operation which I have received from those gentlemen who place their services at the disposal of the Society in the capacity of Honorary Secretaries, Messrs. Sclater and Wordie; and to Mr. Sclater I am under additional obligation, as he has been good enough to take

over the duties of Treasurer during the interregnum between Sir Harcourt Butler's unavoidable resignation and Lord Plender's election.

Now, Ladies and Gentlemen, allow me to take my leave, and close the proceedings.

THE ANNIVERSARY DINNER

The Anniversary Dinner of the Society was held at The Dorchester on Monday 19 October 1936.

The President and Lady Cox received the company, which included, among the Guests of the Society, The Chancellor of the Duchy of Lancaster and Lady Davidson, H.E. the Polish Ambassador and Countess Raczynska, H.E. the Yugoslav Minister and Madame Grouitch, H.E. the Iranian Minister, The Egyptian Chargé d'Affaires and Mme. Hakki, The Chief of the Imperial General Staff and Lady Deverell, The President of the Royal Society, The Director of the British Museum, The Deputy Master of the Mint and Lady Johnson, Lord and Lady Camrose, and Mr. and Mrs. Hugh Ruttledge.

Following the honouring of the loyal toasts, THE CHANCELLOR OF THE DUCHY OF LANCASTER, in proposing the toast of the Royal Geographical Society, said: Mr. President, Your Excellencies, My Lords, Ladies and Gentlemen,—I shall certainly not commence my remarks with the well-known *cliché* "I cannot imagine why the burden, or privilege, of proposing the toast of the Society has been placed upon my shoulders." I have both a public and private reason for knowing why. I rather suspect that because of the activities which fall on any one who holds my office, of maid-of-all-work to the Government and the fact that I am at present presiding over a Committee which owes its thanks for the help which it has received from the Society, and which is engaged upon trying to speed up the revision of the Ordnance maps of this country, a word or two would be welcome from me on that subject. But there is also a private reason which no one knows. I do not believe that any one could have been chosen to speak to-night, especially to propose this toast, who has in his heart more thankfulness for the existence of your Society and all its activities, for I do not believe that any one has ever been born into this world with less sense of direction or location than I have. I am doubtful whether in the presence of my wife I should tell you this little story. At any rate, she allowed me once to take the car and to travel up to London to keep an appointment from a week-end that had been spent in a house near Sevenoaks. After I had driven the car for several hours I found myself passing through the High Street of Limpsfield! Since then I and my wife have travelled together, because that incident proved conclusively that he did not travel the fastest who travelled alone.

A word with regard to the Committee over which I preside may now be of interest to you. We have produced an interim report, and because of it I believe that the revision of the Ordnance Survey maps of this country will undoubtedly be speeded up and that it will be quicker than any one suspected was possible. But there is one word of warning which I should like to utter. We have in this country standards which must not be lowered. We have the finest map-producing machinery in the world, and speed is not everything, especially in the production of maps. Revisers are not easily trained, and it is of the utmost importance that we should maintain the high standard that we have always held in this country. We are engaged on the study of this question. We are also engaged in an experiment in air-photography, but I do not think any one should run away with the idea that air-photography is a substitute for Ordnance maps, as some popular journals would have us believe. Even with my imperfect gifts

I would not like to try to get anywhere by an air-photograph if I had not an Ordnance map in my pocket.

I should like to exemplify the work of the Ordnance Survey Department (of which we have not only ex-Directors but the present distinguished Director with us to-night) by quoting from a report of a scientific body which was set up to advise the American Government on all sorts of matters, and included among them was mapping. The report said: "Committee of the Science Advisory Board. Waste which annually runs into many millions of dollars results from the fact that no standard topographical map is yet available for most of the United States, with the result that every year countless federal, state, county, municipal, and other local and temporary surveys without permanent value must be executed which would be rendered unnecessary were a standard map completed." Fortunately, we do not suffer from that trouble in this country. The report goes on: "There are at least twenty-eight different state agencies and offices concerned with maps and surveys of one sort or another."

If there is one thought which I would like to leave with the Society it is this: the British Empire is gradually being drawn closer and closer to the centre and to its several parts. The annihilation of space is going on apace. Maps are really only fifty years old. Flying a great deal younger. If one thinks of what happened only a few weeks ago, when Scott flew to Johannesburg, it makes one wonder whether it is not within the bounds of possibility that in the near future Africa will cease to be a conglomeration of countries, and will become, at any rate from the point of view of survey and maps, one country, because in a comparatively short space of time geographical frontiers can be crossed, and even in a day three or four may be crossed. Is it possible to think that different surveys and different scales of maps should permanently exist in a continent which will become unified by the annihilation of space? I just throw that thought out for your consideration, because the Royal Geographical Society takes such an interest in these things, and it might be just one of those problems which the Society might so easily help to solve.

The Royal Geographical Society has many activities, and any one who is a layman reads its *Journal* and follows its proceedings with the same kind of feeling that he had when he was a small boy, and believed his ultimate destiny was to be a pirate or tropical explorer setting out to visit the enchanted isles or climb the highest mountain in the world. The work the Society does in assisting original research and exploration is beyond all praise.

Perhaps there is one further thought I should like to mention, because it is one that occurred to me as I was entering this room. We may be on the verge of a return to the Elizabethan or Golden Age. We have seen recently great masters of industry who have made fortunes in this country becoming, as were the great merchants of old in the days of Elizabeth, the patrons of science. We have seen what has been done at Cambridge and what has been done at Oxford. Now, your Fellowship is not purely honorific. Yours is a real Fellowship, in which any one who has the interests and the objects of your Society at heart can become a Fellow. It is a real fellowship of those who are the experts, who go out and do work, the explorers, the map-makers and so forth, and those who are interested as laymen and wish to support their expert brethren by becoming Fellows of the Royal Geographical Society. Now is it too much to hope that the process which is going on and has been so successful with regard to hospitals and to electrical research may be extended by adding to your numbers some Fellows who will put in the forefront of their work and patronage the labours which you do in going out into the uncharted parts of the world and helping those that wish to do so, and assisting all the other activities on which the Society

is engaged? If that comes to pass, as I hope it will, you will have a great accession to your strength, and whoever stands in my place next year, not with any more enthusiasm, but with greater certainty, will ask you to rise to drink to the future prosperity of the Royal Geographical Society, coupled with the name of its President, on this occasion Sir Percy Cox. I give you the toast.

The PRESIDENT in responding, said: Sir John Davidson, Your Excellencies, My Lords, Ladies and Gentlemen. This is the third occasion on which I have had the honour as President to respond to the Toast of the Society. We are immensely indebted to Sir John Davidson for the sympathetic and cordial terms in which he has given the Toast and for the important problem which, in doing so, he has given us to think about. As regards that problem it is naturally a satisfaction to me to recall that in the course of my Annual Address this afternoon, when looking back over the sixteen months which had passed since my last Address, I remarked that most of the prominent features in the record of our life-history for the period seemed to fall within the sphere of Survey.

Before saying more on that subject I would like to say a word as to the most convenient season for our Annual Meeting and Dinner. Normally, for a good many years past, they have taken place in June, but as that month fell within the period of Court mourning for his lamented Majesty and our late Patron, King George V, the date was postponed until to-day. It was a matter of some interest to see whether the change of date to the autumn would prove as convenient to Fellows as the middle of the London season, or whether (having also regard to the fact that the place for the dinner was also changed) the strength of the gathering here to-night would be less than usual. It is a great pleasure to me to see that there has been practically no difference. I regard that as good evidence of the sound health of the Society.

Reverting now to the subject of survey in general, and the labours of Sir John Davidson's Committee in particular, I should like to say how very grateful we were for the invitation which he was so good as to extend to the Society, to lay before his Committee any suggestions which we might think it relevant to make in regard to certain points of reference.

It was evident from what passed at the periodical Conference of Empire Surveyors, and at other gatherings interested in survey problems, that a very general feeling prevailed that both the interests and activities of survey, both at home and throughout the Empire, would be very much benefited if some central co-ordinating institution were established. In referring this afternoon to the passing of Sir Henry Wellcome, a distinguished Fellow of the Society, who died quite recently, I spoke of his great benefactions to the science of medicine, one of the last of which was to establish a central laboratory for guiding and correlating the work of various subsidiary branches of medical research working in different parts of the Empire. An institution of that sort is what we feel is urgently needed in the sphere of survey. Not only is the Survey of the British Isles concerned, but also those of the Colonies and Dominions. In my remarks on the subject this afternoon I mentioned by way of illustration the recent instance of a certain well-known hunter in East Africa, who was on safari in the region of Mount Kenya with the object of obtaining a specimen of a reported pygmy species of lion which was believed to exist there.

In the course of his search he discovered a new lake on the mountain previously unknown to the Survey of the Colony! I mention this merely as evidence of the need which everywhere exists of getting our surveys brought up to date.

Now as to the fortunes of our Society. The Chancellor of the Duchy of Lancaster has given you the toast of our health, and on the whole I think I may say that it is good. Like every other society and club during the trying post-war

years, it has not always been easy to keep the numbers of our Fellowship up to the peak-point. We have gravitated round the six thousand mark; but, as I need hardly remind you, the Society's activities depend almost entirely on the income from subscriptions, and if we want to increase those activities, for which there is plenty of scope, we must not only maintain but increase the strength of our Fellowship.

It was only a few nights ago that the noble lord who will shortly propose the toast of our guests and I were attending the Annual Dinner of another Royal, but much younger, society to which we both belong. He, Lord Onslow, occupied the chair, as President, and in that capacity was emphasizing, as I did just now, the importance of bringing more friends into the fold. In doing so he remarked that perhaps *I*, after the experience of three years as President of this Society, might be able to suggest appropriate means to that end. I can perhaps give him one or two helpful suggestions, but I need not go into them here. Speaking off-hand I am not quite sure, though I ought to be, whether in that Society those who belong are styled "Members" or "Fellows." With us here our "Fellowship" is a designation which is given us in our Charter and we treasure the term, but its use no doubt carries some risk. I wonder if Lord Onslow remembers the story of the lady who asked the President of some other distinguished institution if he knew her husband, who took a great interest in its work and was a strong supporter of it. The President replied: "Yes. But surely he is a Fellow, isn't he?" "No indeed," replied the lady. "He is a Gentleman."

It is always a great pleasure to us to welcome back those who have been exploring and to hear their personal accounts of their experiences, and our lectures during the past session seem to have formed a good and varied series; two of them from foreign scientists, who were good enough to come over and read papers to us. And it has been a particular pleasure to Fellows of the Society, and to me personally if I may say so, to welcome Lord Curzon's daughter, Baroness Ravensdale, on our lecture platform, and, again, to greet her to-night at her first dinner as a Fellow of the Society. We can never forget the great services which her distinguished father rendered to the Society, especially those strenuous efforts to find the funds which enabled us to acquire the beautiful premises which we now so much appreciate.

I am sure we are all very glad, too, to have among us to-night the leader and several members of the 1936 Everest Expedition. In a few days we are going to hear Mr. Ruttledge's account of the fortunes of his team, so I should not now trespass on his ground. As you know, the conquest of Everest has practically resolved itself into a question of luck with the weather. We know the ropes thoroughly and we have got the men; but we cannot legislate for the vagaries of the weather. It is my confident hope however that we shall go on trying and trying, until the luck turns.

I had the honour, after the ballot this afternoon, to pay brief tribute to my successor and the distinguished gentlemen nominated and elected to the Council of the Society for the coming Session. In your President, Professor Henry Balfour, you have a very eminent scientist, a Fellow of the Royal Society and an anthropologist of wide repute. He is also a chairman of ripe experience, and your scientific interests will be in wise and safe hands. And I know that it must be a source of great satisfaction to Fellows of the Society to learn that such a famous expert as Lord Plender, in the realm of finance and public service, notwithstanding the innumerable calls on his time, has seen his way to accept nomination as Treasurer of the Society.

I will detain you no longer except again to thank the Chancellor of the Duchy of Lancaster for the sympathetic and helpful terms in which he addressed us in

giving the toast of the Society, and to express our appreciation of the cordiality with which it was honoured.

The PRESIDENT-ELECT (Professor HENRY BALFOUR), in proposing the toast of The Medallists, said: The task which has been assigned to me since I had the privilege of being elected this afternoon to take a high place in this Society is that of proposing the health of our Medallists. But may I be allowed to digress for a few brief moments to perform a more personal duty.

This is the first opportunity which I have had of endeavouring to thank the Council, and the Fellows of the Society who have endorsed the Council's nomination, for the high and wholly unexpected honour which has been done to me to-day. When I look down the list of those who have held the presidency of this important Society I am awe-struck at my temerity in accepting nomination.

I do wish to thank the Society heartily for this very great honour. I have a difficult time in front of me in view of the high standard of efficiency set by my predecessors. It is my privilege to step into the shoes of one who has never spared himself in his endeavours to promote the welfare and to maintain the prestige of the Royal Geographical Society. I can only hope that when my nether end steps into his shoes I may feel that my upper end is becoming clothed with his mantle, because that would hearten me and give me confidence.

Let me proceed to the task which has been assigned to me of proposing the health of our Medallists. It is a difficult task for me, since for fifty years or so I have been following the profession of an ethnologist, and as such I have been concerned with the study of the more primitive peoples of the world. My professional technique has been developed around the study of these unrisen peoples whom some would speak of as "savages," though that is a misnomer. But now I am called upon to speak about some of the most advanced products of evolved civilization.

The Founder's Medal has been awarded to Mr. G. W. Murray, Director of Desert Surveys in Egypt. It is very greatly to the credit of the Egyptian Government that they have established a special department whose function it is to investigate the past history, the physical conditions, and the potentialities of those somewhat forbidding areas.

The Egyptian Government showed keen discernment in selecting for its director Mr. G. W. Murray. His intimate knowledge of the desert and his close acquaintance with its native inhabitants of the area well justified that choice. His recent book dealing with the Badawin population, which he calls 'Sons of Ishmael,' exemplifies the range of his observation.

Mr. Murray has placed his great knowledge at the disposal of others, and there must be many who bless him for the aid and sage advice which he has so freely given.

The Patron's Medal has been awarded to Major R. E. Cheesman. While he was serving in Mesopotamia with his regiment, the Buffs, he came under the notice of Sir Percy Cox, who realized his special flair for exploratory work and geographical research, combined with administrative ability. Sir Percy Cox encouraged Major Cheesman to follow his inclinations, and that encouragement has brought about important results, first in Arabia and later in Ethiopia.

Between 1925 and 1934 Major Cheesman was H.M.'s Consul at Dangila, a lonely post, but I think he did not find it dull, because he filled up every moment of his time, both official and spare. He added to his official duties self-imposed work, which led him to explore a very wide area around his post: Lake Tana and the main source of the Blue Nile, and the gorge of that river, so important for the future of irrigation schemes in the Sudan.

It speaks very highly for some of our British officers abroad that they are in

their enthusiasm so willing to impose upon themselves other tasks than those which are set them, and to work whole-heartedly in the cause of science.

The work which has brought fame and the Victoria Medal to Dr. Stanley Kemp owes it origin to commercial ventures. When the whaling industry of the Arctic regions became played out, almost non-existent, that same industry took a new lease of life in the Antarctic, and the Government of the Falkland Island Dependencies found themselves enriched by dues paid by the whalers for the privilege of using certain bases in the British Sector. Very wisely the Government, finding itself unusually rich, decided to devote some of its funds so acquired for research into the general conditions of the Antarctic regions, with special concentration upon the natural history—using that term in a very wide sense—of the whale.

From the inception of this scheme Dr. Stanley Kemp has directed the scientific work, which has a practical as well as purely scientific outcome.

The toast as it appears on the list is the toast of The Medallists, but I would include also within the toast those who have received the other awards of the Society as the recognition of important and outstanding work which has been done by the recipients.

I ask your forgiveness for having detained you so long, and for having performed my task inadequately. But, having brought myself into a state of postprandial altruism, I cheerfully concede to Sir Percy Cox any blame that attaches to the fact of his having called upon an ethnologist to deal with these high products of an advanced civilization.

Mr. G. W. MURRAY: May I thank Professor Balfour for the very kind words in which he proposed the health of the Medallists, and you, ladies and gentlemen, for the hearty response you gave to this toast. I suppose all members of the great survey departments who have received one of the Society's medals have felt at the time a sneaking consciousness that whatever their achievements they have personally hardly earned it. When I think of the immense obstacles, not all preliminary ones, that lie in the path of any privately equipped expedition to the wilds, obstacles that are overcome in the way of routine by a permanent organization, I feel like a schoolboy, who in a competition at drawing circles freehand has made effective use of a pair of compasses. Such real Giottos as Mr. Philby and Major Bagnold are definitely not amused when they see the diagram of our triangulation extending over the desert. But the feeling of the age is coming round more and more to the side of collective organization and effort.

The idea of surveying, as a whole, a desert which could hold France and Germany combined is a grand one, and the task one for a team. We have had Dr. John Ball's example to inspire us, and the enterprise itself to lure us on. I can't call it work, because, as some wise man has said, it isn't work unless you don't like it.

As I said this afternoon, I regard my medal as shared with my colleagues, some of whom ought to be better known to you. The two legs of my compasses have been Mr. G. F. Walpole, the first to prove that 7000 square miles of Libyan desert lay below sea-level—the Qattara depression—and Mr. P. A. Clayton, who led the only expedition which has traversed the Great Sand Sea against the grain of the dunes, that is, east to west from Ain Dalla in Egypt to the Italian oasis of Kufra. Those were the days when an amateur explorer, Mr. Wingate, sighted for a moment the lost oasis of Zarzura, and later on found it to be a mirage of Egyptian Government motor car No. 1269.

Mr. Michael Mason has just written a witty book and dubbed the Libyan Desert the "Paradise of Fools." I hope I have said enough to show that we are

as bad as any of them, and that nobody can boast he has rushed in where we fear to tread.

Major CHEESMAN: When I heard I had been honoured by the award of the Patron's Medal I found myself mentally dividing it up among those who had contributed towards my effort. The first section of the medal—and that was a large one—was due to the Royal Geographical Society. Twenty years ago I had the advantage of a course of instruction under Mr. Reeves at the Society's house, and ever since, on my various expeditions, I have carried with me not only the good wishes and the encouragement of the Society, but also a valuable set of instruments which the Society had loaned me.

Another section of the medal went to the draughtsmen in the Society's map-room and to those in the Geographical Section of the War Office, particularly as they transformed my rough drawings into maps. In this connection I must mention Mr. Scotland, who has, I think, retired now. He knew more of Abyssinia, although he had never been there, than any Abyssinian or I or any other European traveller who passed through the country. I remember on one occasion we were in the War Office and, on the map, were climbing a very high hill, and he positively got out of breath.

A section of the medal goes to the bearers, both Abyssinian and Sudanese, who loyally stood by me in difficult times and without whom I could have done very little indeed. There was not much of the medal left for me, but I kept a little for myself because I did supply the raw material. I am particularly glad to have been able to contribute a small paragraph to the story of the unveiling of the Nile and its tributaries. I do not mean that there is not a great deal left to do, but the last chapter in the long tale of the tracing of the course of that mighty river has at last been told.

May I be allowed to allude to the great part played by the Royal Geographical Society in putting the Nile on the map. There is hardly any one who has been famous in the history of Nile exploration—Livingstone, Speke, Baker, and Stanley—who has not received assistance, in some cases the sinews of war, from this Society. I have realized during the playing of my small part how much I was leaving to be done by those who follow. I hope that those will be Englishmen.

I have now joined what we are told is the second line of defence. My wife and I are, in fact, farmers. I find it much the same now as when I left the land a great many years ago. Then we were told that there was a good time coming for the farmer. We hear the same to-day. Everything seems to have been tried during these years to get people to leave the towns and go back to the land. If money was put back into the land it would be hardly necessary for people to cry "Back to the land." There would then, I think, be an ugly rush. Agriculture has however by the aid of science made enormous strides. We have electricity, balanced fertilizers, and balanced cattle foods; in fact everything on a modern farm seems to be balanced except the balance sheet.

I thank you for the kind way in which you have received this toast, and I am very grateful to our distinguished President, my chief in Baghdad, who started me on my first journeys of useful travel.

Dr. STANLEY KEMP: I am very glad to be able to add the expression of my thanks for the very kind way in which this toast has been proposed and received. Personally, since I reckon myself a zoologist with leanings towards oceanography, I never thought it possible that my name could appear on the distinguished roll of your Medallists. As I said this afternoon, I take the award to mean that the scope of this Society is wide enough to include both geography and oceanography.

You may perhaps remember the story of the small boy who had only a child's interpretation of the fourth Commandment, and how on his first Sunday School treat to the seaside he was grievously disappointed that no one could show him the "tinemies." Here we find, I believe, the very best definition of oceanography: the seas and "all that in them is." For oceanography includes not only coastal surveys and the physics and chemistry of sea-water, but all the life, both plant and animal, that it contains, and the geology of the sea-floor as well.

In these days, when so much of the land surface of the world is as well known as the back of one's hand, oceanography, in one or other of its many attractive aspects, may confidently be recommended. It is a field which offers to the explorer vast tracts of unknown territory and the prospects of many great discoveries.

The Earl of Onslow: Mr. President, Your Excellencies, My Lords, Ladies and Gentlemen, it is a tradition of this Society to invite to this annual function a number of guests, to extend to them a very hearty welcome, and to signify that welcome by asking you to drink to their health.

I am going to couple with this toast the name of H.E. the Polish Ambassador. To him and to Countess Raczynska the Society extends a hearty and sincere welcome. We have all of us been deeply interested in the fascinating study of the history of his great country, and we welcome him here to-night—I think it is the first occasion on which he has honoured us by his presence—in the most hearty manner.

Then we have with us H.E. the Yugoslav Minister, M. Grouitch, of whom, when I was in the Diplomatic Service, I had many pleasant recollections. We are all, especially myself, only too delighted to see him here to-night with Madame Grouitch.

To H.E. the Iranian Minister we would like to extend our thanks as a Society for the assistance which his Government have rendered to many travellers in his beautiful country, many of whom are Fellows of this Society.

To the Egyptian Chargé d'Affaires may I offer my congratulations, that a member of the Egyptian Government has been honoured to-day by receiving a medal of the Society.

As regards the Army, we are particularly fortunate in welcoming the Chief of the Imperial General Staff and Lady Deverell. I was rejoiced to hear from the Chancellor of the Duchy of Lancaster, who is also our guest, with Lady Davidson, to-night, that the Society has been of assistance and continues to be of assistance to the Army in the preparation of the Ordnance Survey maps.

As is fitting and proper, learning is here to-night in force. We have among us the President of the Royal Society. The other night, at the dinner to which Sir Percy Cox referred, Mr. Ormsby Gore said it was a feature of English life that every kind of interest had a society to support it unless somebody started another society to oppose it. The first of all these societies was, I think, the Royal Society, and I remember some years ago Lord Balfour telling us—I think it was his last appearance in public, just before his illness, when he resigned the presidency of the British Academy—that in the Charter of the Royal Society there would be ample room for the work of all the other societies in the country put together. But we have endeavoured to considerably relieve the Royal Society of some of their labours.

Then I am sure we are all delighted to see here this evening the Vice-Chancellor of Cambridge University. It would be a lasting regret of my life that I was not a Cambridge man if I had not been an Oxford man.

Then the arts are not lost sight of. We see here the Director of the British Museum, and as the Royal Society was the parent of all the other societies, so the

British Museum is the parent of all the other collections in the country, and I think it is—I am not quite sure—perhaps the grandparent of the museums of the country.

But perhaps I would particularly like, and you would wish me, to say a word in recognition of two of those who have rendered particularly personal assistance to the Society. In the first instance, we welcome Lord and Lady Camrose. Lord Camrose has been a most generous helper towards the two Everest Expeditions, and for that and for many other things the Society is deeply grateful to him. Then there is my old friend Sir Robert Johnson, the Deputy Master of the Mint, and Lady Johnson, to whom we owe the medals. He strikes the medals for the Society, and I am sure those who have received them and made those interesting speeches will be deeply grateful to him for the work he has done.

There are here to-night, I fancy, numerous other guests to all of whom I should like to refer in person, but I am sure you would wish to hear the Polish Ambassador rather than to hear me at any greater length. I would however like to thank those who have done me the honour of dining with me for doing so and attending this dinner.

Just one word to thank the President for what he has promised to do, and that is to tell me how to get more members for the Society for the Preservation of the Fauna of the Empire to which he referred just now. I gather that he has a great deal of information to impart, and hope as a result we shall have as many members as there are Fellows of the Royal Geographical Society.

I give you the toast of The Guests of the Society to-night, coupled with the name of H.E. the Polish Ambassador.

H.E. THE POLISH AMBASSADOR: Mr. President, My Lords, Your Excellencies, Ladies and Gentlemen, I will try to be very brief. I think we have had very wonderful speeches to-night and you will not expect me to make a very long one. But I cannot refrain, having heard so many good stories from the distinguished orators, from telling you another, which will be, of course, very bad and told in my worst English.

There was once upon a time an energetic business man who was most dissatisfied with a man with whom he was having dealings and wanted to scold him. He asked his chief clerk to do this for him but, as he was a little doubtful whether the clerk would do it properly because he thought he was too kind-hearted, he lectured him at great length and explained what he was to say to, and how he was to squash, the naughty man. After a long harangue, he asked his chief clerk if he understood the point and whether he would do the job properly. The only answer was a loud "Ugh !!" as an indication that he grasped what he had to do and was full of enthusiasm and energy for his task. It is in a similar spirit that I undertook my task to-night, very willing, although very frightened, to do it properly.

It is a difficult but at the same time very honourable task to reply to and to thank Lord Onslow for what he said, for I have not only to do that in my own name but in that of my fellow-guests. I have never had the pleasure of meeting Lord Onslow, although I have heard a great deal about him and know not only all the fine work he has done for his own country but also something of the interest he has shown in other countries, including my own. I know also of the work he has done in connection with the School of Slavonic Studies, in which he has taken a very deep interest.

It is interesting to note the many walks of life from which your guests come because they are interested in the work of your Society. We have amongst us my fellow-diplomats, public servants, scientists, soldiers. We have even a money-

maker. It really is not easy to give adequate expression to the feelings of all here to-night and to tell you something worth hearing.

I am, of course, very badly chosen for my job, having travelled very little outside Europe. I am however not quite ignorant. I am not one of those who are not quite certain about the distinction between geography and geodesy, for instance. But my travelling was mainly done on the map. I started it very young; in fact, when I was still at school and was tempted by that wonderful document the map of our planet and went wandering, in thought, from land to land and picturing to myself all the glamour of those many countries that I would perhaps never see. I had not of course the great inducement that is the common property of all those who have the honour to be citizens of Imperial Britain. I could not find on the map, as you do, those wonderfully exhilarating red patches. I had not even the comfort of finding on the map the one patch which would show my own country from which to start on my travels. But that is past history.

This Society, as we have heard, does not indulge in idle speculation. Your Medallists have been doing the real work. I can remember my first connection with the Society, a fairly distant one. It was, I believe, in 1924, when I was working in England as Secretary of the then Polish Legation. I was asked to view, with a friend of mine, the wonderful slides of the first Everest Expedition. I remember the lecture given by a member of the expedition, and I do not forget the tragic deaths of those two young men who lost their lives on that expedition. There was a second attempt, and I was gratified to hear that we have amongst our guests to-night Mr. and Mrs. Hugh Ruttledge. His name has been connected with this great effort and I hope and trust that though the mountain has so far resisted assault, the next attempt will result in the success of the climbers.

I conclude with a few words in which I assure you that it is with great warmth in my heart that I associate myself and my fellow-guests with the acknowledgment of the toast and thanks to the Royal Geographical Society for the hospitality extended to us, together with an expression of our deep and unbounded admiration for the marvellous qualities which for many long years have been manifested by the Fellows of the Society in geographical exploration.

First Evening Meeting, 2 November 1936. The President in the Chair

Paper: The Mount Everest Expedition of 1936. By Mr. Hugh Ruttledge

Second Evening Meeting, 16 November 1936. The President in the Chair

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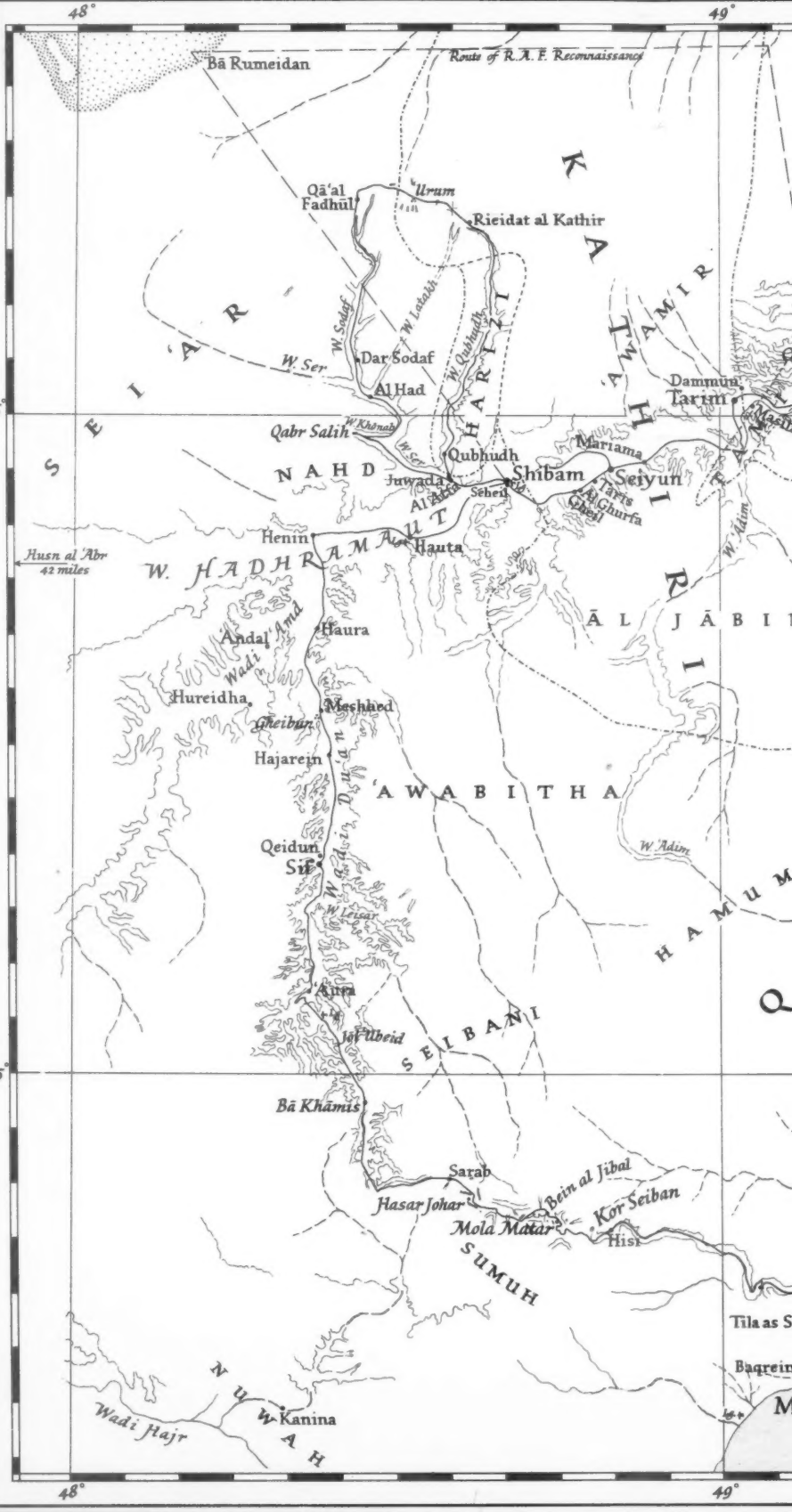
Paper: The Motor Route from Peking to Kashgar. By Sir Eric Teichman

First Afternoon Meeting, 2 November 1936. The President in the Chair

Paper: The Mount Everest Expedition of 1936. By Mr. Hugh Ruttledge

Second Afternoon Meeting, 9 November 1936. The President in the Chair

Paper: The Glaciers and Morphology of the Franz Josef Fjord. By Mr. N. E. Odell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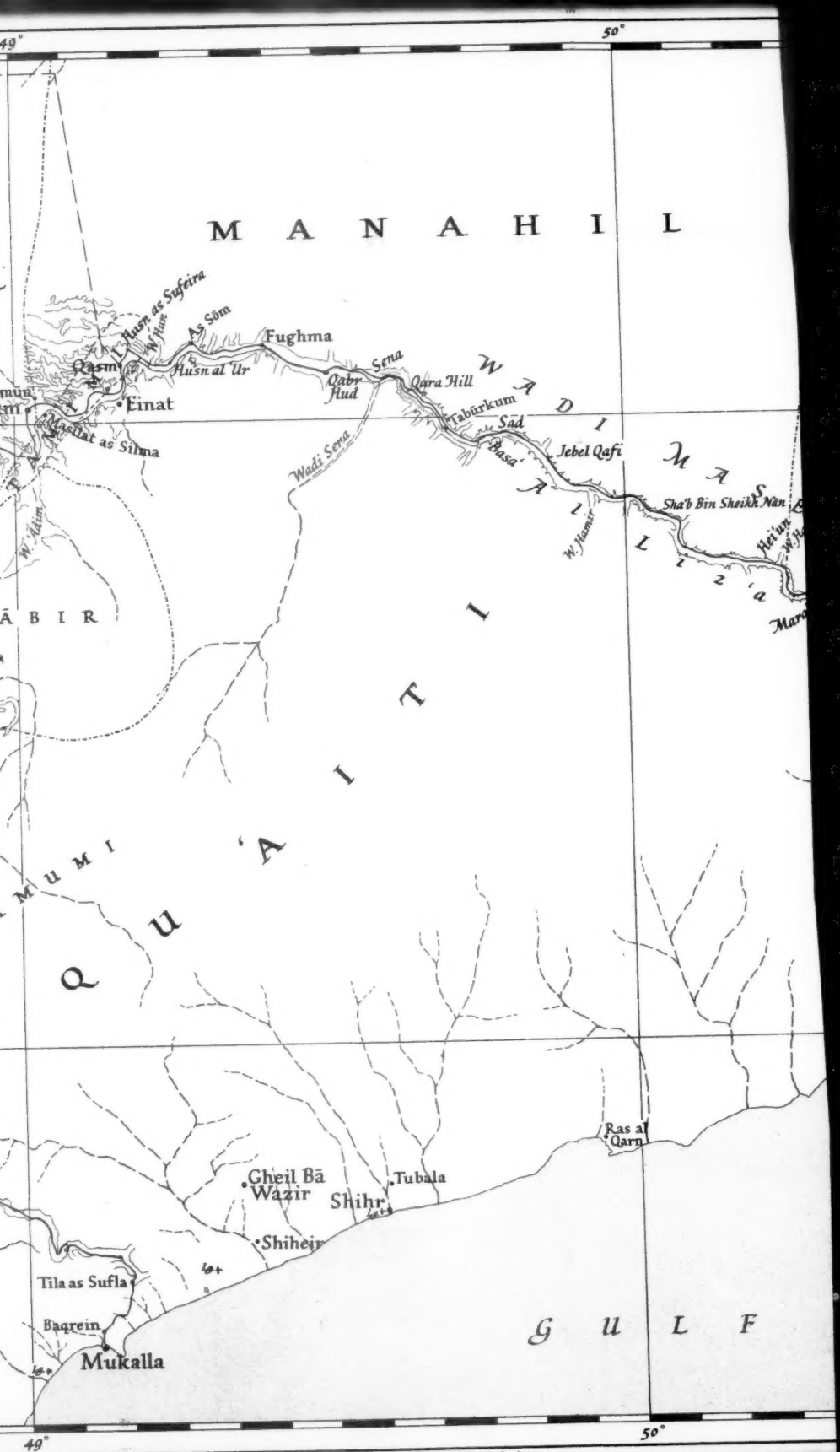
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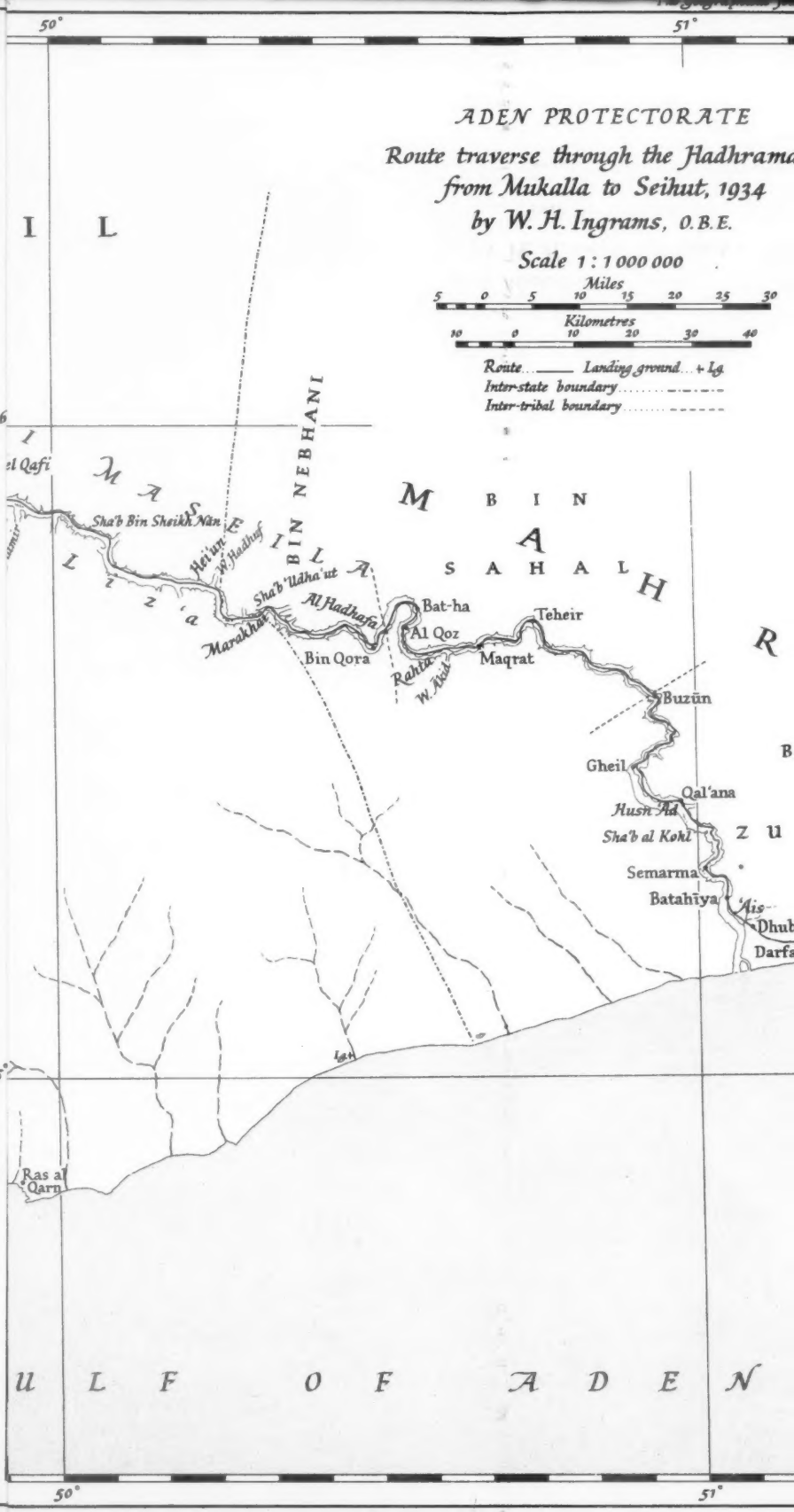
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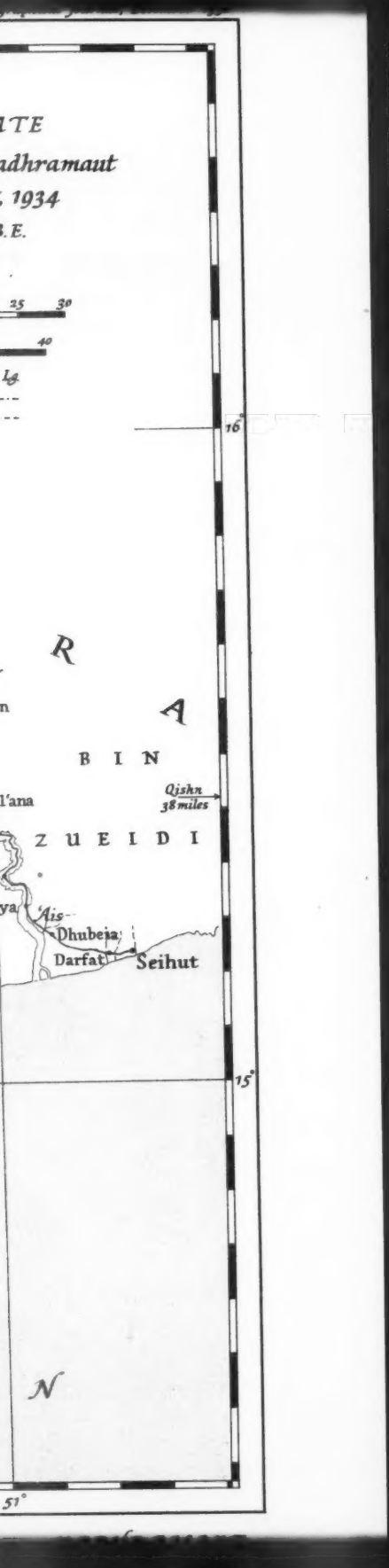
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INDEX

Denotes Articles and Papers § Reviews and Notices

A

ABAJI, Dance of Bassas at: D. K. Kennett, 456 *
Aberconway, Lord, remarks on "Botanical, etc., Explorns., Tibet 1935," 410
Abercrombie, P., and S. A. Kelly, East Suffolk Regional Planning Scheme, 352 §
Abyssinia— Im Lande des Gada: A. E. Jensen and others, 562 §
Acosta, J. de, quoted on Peru countercurrent, 38–9
Aden Protectorate, 524–5
Africa, East— East African Arc: M. Hotine, 471 §; Provisional Soil Map: G. Milne, 465 §
——, Cent.— France Equatoriale Africaine: G. Bruel, 361 §
——, South— Economic Development of British Overseas Empire: L. C. A. and C. M. Knowles, vol. 3: Union of S. Africa, 360 §
——, West— Afrique Noire Occidentale: E. E. Gautier, 178 §
Aguaje phenomenon, Peru littoral, 52, 57, 59
Ahlmann, H. W., Scientific Results, Norwegian–Swedish Spitsbergen Expedn. 1934. Pt. 5. Fourteenth of July Glacier, 275 §
Air Survey and Ordnance Survey Maps, 489
Alaska, reindeer in, 4–5
Alexander, N., Wanderings in Yugoslavia, 266 §
Algerian Sahara, *see* Sahara, French
Allen, W., *see* Murchie, R. W.
Allenby of Megiddo, Field Marshal Viscount, Obit., 95, 482
Alps— Alpine Geology: E. J. G. (*rev. of* Sölch's 'Fluss u. Eiswerk'), 263 §; Structure of A—: L. W. Collet, 355 §
Amdrup, quoted on Scoresby Sound coast, 193
America, Discovery, *see* Columbus
———, North-West— Cradle of Storms: B. R. Hubbard, 365 §
———, South— Fuentes, Historia Cultural de la America Precolombina: H. Trimborn, 469 §; Geologie Südamerikas: H. Gerth, 470 §
Amorim Girão, A. de, Licões de geogr. humana, 184 §
Amundsen, Roald, Explorer: C. Turley, 88
Andagoya, P. de, quoted on Peru Coastal Current, 38
Anderson, I. F., Scot over Border, 168 §
Andrews, R. C., Business of Exploring, 188 §
Angkor, *see* Bali
Angola, Reisen u. Forschgn. in: O. Jessen, 362 §
Antarctic— convergence, 315; pack-ice, 307; British Graham Land Expedn., 165 *
Anthropology— Custom is King: Essays presented to R. R. Marett: *Ed.* L. H. D. Buxton, 474 §
Arabia, Journey by H. St.J. B. Philby, 475; *see* Ethiopia
Arabs, Palestine of: S. Erskine, 76 §
Arctic, Policing the: Major H. Steele, 276 §; Research, *see* Russian
Argentine National Park, Nahuel Huapí, 288
Arun river gorge, Himalaya, 294
Ashby, T., Aqueducts of Ancient Rome: *ed.* I. A. Richmond, 552 §
Asia: Regional and Economic Geography: L. D. Stamp, 572 §
——, Central, Journey through: P. Fleming, 128 *; *see* Tartary
Aspar, Persia, 29–30
Assam Plateau, *see* Shillong
Atchin Id., Malekula, New Hebrides, 339–41; A— Twenty Years Ago: J. W. Layard, 342 *; Name, 342
Atter, M., death in West Greenland, 157
Australia, Central: C. T. Madigan, 275 §; Journey in, E. A. Colson on, 383 §; Mythos und Kult der Steinzeit: J. Winthuis, 91
————, North: C. P. Conigrave, 470 §
Australian Tektites [Australites], C. Fenner on, 287 §
Avalanches, Windslab, 508–9
Ayub Khan, Muhammad, Back Grant to, 579

B

BAAK, J. A., Regional Petrology of Southern North Sea, 84 §
Baffin Land, Journey in Southern, J. D. Soper on, 384 §
Bagnold, Maj., new Member of Council, 581
Bahr-el-Ghazal— Gentle Savage: R. Wyndham, 273 §
Bailey, Col. F. M., and Maj. Morshead, quoted on sources of Subansiri river, 387
Baker, J. R., quoted on New Hebrides, 243, 333, 337, 341; remarks on "Living with People of Malekula," 127

Balfour, Prof. H., President-elect, R.G.S., 581; proposes toast of Medallists, 586; remarks on "Mt. Everest Expedition of 1936," 519, 520, 522; on "Living with People of Malekula," 125
Bali and Angkor: G. Gorer, 559 §
Baltic Geodetic Commission— Verhandl., Balt. Geodät. Kommission, 1935: *Ed.* I. Bonsdorff, 85 §
Baltit, Hunza, 143
Baluchistan earthquakes, 421–2, 425–6
Bandar Shah, Caspian port, 221–2
Banks Ids. natives, 332 *et seq.*
Barberton mountainland, S.E. Africa, 322 *et seq.*
Bassas, Dance of, at Abaji: D. K. Kennett, 456 *
Batalha-Reis, J., death, 483
Bear of Oakland meets *Discovery II* in Ross Sea, 307–8
Beckett, S. J., Wayfarer in Norway, 75 §
Belloc, H., County of Sussex, 352 §
Bengal, Population Maps of: A. Geddes, 96 (*title only*)
Bernatzik, H. A., Gari Gari, 561 §
Berghaus, quoted, on Peru Coastal Current, 46, 60
Bertram, —, quoted on biology of Grahamland, 166–7
Betagh, —, quoted on climate of Peru, 40
Blanchard, R., L'Est du Canada Français, 364 §; on geogr. of Cent. Quebec, 92
Boas river, Southampton Id., 238
Bonsdorff, I., *ed.* Verhandl., Baltischen Geodätis. Kommission 1935, 85 §
Booth, J. F., *see* Murchie, R. W.
Bornebusch, C. H., and K. Milthers, on Soil Map of Denmark, 574 §
Borneo, *see* South Sea Savages
Botowut-Venuntavai tribe, Malekula, 100–1
Bougainville, quoted on Peru Coastal Current, 43
Bounty, *see* Morrison, James
Bracewell, H., quoted on British Guiana Falls, 262
Bray, Maj. N. N., Paladin of Arabia: biography of Col. G. E. Leachman, 268 §
Britain, South-East, Roman Roads in: G. M. Hughes, 379 §; *see* Gt. B—
British Empire— Conference of Empire Survey Officers, 1935, Proc., 568 §; Economic Geogr. of B— E—: R. O. Buchanan, 558 §
Brown, A. C., Horizon's Rim, 187 §
Bruel, G., La France Equatoriale Africaine, 361 §
Bubnoff, S. von, Geologie von Europa, 75 §
Buchanan, R. O., Economic Geogr. of Brit. Empire, 558 §
Bull, A. J., on Geomorphology of South Downs, 476 §
Bullard, E. C., and H. L. P. Jolly, Gravity Measurements in Gt. Britain, 370 §
Burrard, Sir S., quoted on former course of Tsangpo, 392–3, 409
Bushell, K., Papuan Epic, 183 §
Bustam, Persia, 223
Butler, Sir H., new Member of Council, 581
Buxton, L. H. D., *ed.*, Custom is King: Essays pres. to R. R. Marett, 474 §

C

CALIFORNIA, Historic Spots in: H. E. and E. G. Rensch and M. B. Hoover, 468 §
Campbell, A., quoted on acclimatization at high altitudes, 513
———, F. A., quoted on New Hebrides, 338, 341
Canada, Western, Colonization: R. England, 274 §
Canadian Eskimo, Reindeer Industry and: E. Porsild, 1 *
Cape Horn weather, 307
Carey, A. D., Obit., 191, 484
Caribbean— Hist. Geology of Antillean-Caribbean Region: C. Schuchert, 368 §
Carolina, North and South, J. J. Petty on Fulgurites in, 268 §
Cartography— Alpenvereinskartographie, usw.: R. Finsterwalder, 277 §
Caspian Sea, Variations of Level, W. Köppen on, 476 §
Cater, Sir N., remarks on "Quetta Earthquake," 428
Cattle ranching, Swaziland, 328
Celts, Greatness and Decline of: H. Hubert, 571 §
Chaco— Enchanting Wilderness: H. Tolten, 367 §; Der Gran Chaco: H. Kanter, 80 §
Charcot, Dr. Jean, Obit. by W. E. G., 478, 482
Chatterjee, S. P., Le Plateau de Meghalaya (Garo-Khasi-Jaintia), 358 §
Cheesman, Miss E., quoted on Malekula, 98, 103, 107
———, Major R. E., Patron's Medal to, 92, 577–8; Lake Tana and Blue Nile, 272 §; Speech at Annual Dinner, 588
Cherchen Oasis, Sinkiang, 140–1
China— Chinesische Reich: G. Wegener, 357 §; Hist. and Commercial Atlas of C—: A. Hermann, 271 §; My Country and My People: Lin Yutang, 171 §
Choffat, P., Applicatn. de la téléphotographie en topographie d'explortn., 277 §
Church, J. E., President, Internat. Commission for Snow, 93
Cieza de Leon, P. de, quoted on Peru counter-current, 38
Clarke, D., Public School Explorers in Newfoundland, 79 §
Clay, M. C., *ed.* Proceedings, 5th Congress Internat. Federation of Surveyors, 1934, 89 §

Close, Sir C. F., letter on Doubly-Equidistant Projection, 480
Collet, L. W., Structure of Alps, 355 §
Colson, E. A., on Journey in Central Australia, 383 §
Columbus, Truth about, and Discovery of America: C. Duff, 279 §
Congo Basin— My Pygmy and Negro Hosts: P. Schebesta, 78 §
Conigrave, C. P., North Australia, 470 §
Cook, Capt., discoveries of, 319–20
Coon, C. S., Measuring Ethiopia and Flight into Arabia, 272 §
Cornish, V., quoted on storm waves, 444
Correns, C. W., and others, Das Meer in Volkstüml. Darstellgn. Bd. 3. Tiefseebuch, 567 §
Cotton, Prof. L., quoted on tidal stresses and earthquakes, 425
Courtauld, A., Journey in Rasmussen Land, 193,* 485
———, Mrs. A., remarks on "Journey in Rasmussen Land," 213
Cox, Sir P., Address at Annual Meeting, 481*; remarks on Annual Report, 580; on "Botanical, etc., Explorns. in Tibet, 1935," 410, 412, 413; on "Journey in Rasmussen Land," 209, 215; on "Journey through Cent. Asia," 144, 147; on "Living with People of Malekula," 124, 127; on "Mt. Everest Expedn. of 1936," 521; on "Oxford Univ. Greenland Expedn., 1935," 159, 161; on "Persia in 1935," 226, 229; on "Photographic Surveys in Mount Everest Region," 300, 302; on "Quetta Earthquakes," 428, 430; on "Reindeer Industry and Canadian Eskimo," 17, 19; on "Third Commission of R.R.S. *Discovery II*," 318, 321; on "Variations in Behaviour of Peru Coastal Current," 61, 64; speech at Annual Dinner, 584
Craig, M. J. I., quoted on Doubly-Equidistant Projection, 480
Cruikshank, Gen. E. A., Life of Sir Henry Morgan, [and] English Settlement of Jamaica (1655–88), 472 §
Crump, W. B., and Mrs. G. Ghorbal, on Huddersfield Woollen Industry, 381 §
Curzon, Lord, quoted on travelling in Persia, 222–3
Czecho-Slovakia, Dr. V. J. Novák on Geomorphology of, 286 §

D

Dalloni, M., Mission au Tibesti (1930–31), 177 §
Dampier, quoted on S.E. trade of Chile, 40
Darby, H. C., *ed.*, Historical Geogr. of England before A.D. 1800, 375 §
Darling, F. W., *see* Lambert, W. D.
Davidson, Sir J., and Ordnance Survey, 489; speech at Annual Dinner, 582
Davis, V., Guide to Snowdon and Vale and Pass of Llanberis, 462 §
Davison, C., quoted on earthquake faults, 423
Deacon, A. B., quoted on Malekula, 97, 103
Dease Bay seiches, 5
Defant, A., *see* Correns, C. W.
Degner, H., *see* Hanke, M.
Deh Dasht, plain, Persia, 29, 30
Denmark, Soil Map, C. H. Bornebusch and K. Milthers on, 574 §
Dennis, W. M., *see* Rannie, J. L.
Dinklage, quoted on Peru Coastal Current, 44
Discovery II, Third Commission of R.R.S.: N. A. Mackintosh, 304*; Personnel, 305
Douglas, C. K. M., Appendix to "Snow Structure and Ski Fields": G. Seligman, 372 §
Douglas and Clydesdale, Marquess of, and D. F. M'Intyre, Pilots' Book of Everest, 473 §
Douglass, A. E., on Dating of Annual Ruins by Annual Tree-rings, 93 §
Doveton, D. M., Economic Geography of Swaziland, 322*
Downs, *see* South Downs
Dra'a, Wadi, Captain Pigeot on course of, 382 §
Du'an, Wadi, Hadhramaut, 532–3
Duff, C., Truth about Columbus and Discovery of America, 279 §
Dunbar, M. J., Vegetation and Fauna of Sarfartok River District, West Greenland, 158
Durham, Early MS. Map of County of, G. Manley on, 382 §
Dyhrenfurth, G. O., and others, Dämon Himalaya: Internat. Karakoram Expedn., 1934, 358 §
Dyott, G. M., quoted on fate of Colonel Fawcett, 66 *et seq.*

E

Earthquake faults, 422–3
East, Sixty Years in E—: Sir W. Willcocks, 185 §
"East, Far," F. C. Wieder on term, 191;
East, Middle— Camel-Bells of Baghdad: J. Miller, 172 §
Echo-sounding recorder, 317
Economist's Handbook: G. Verwey and D. C. Renooij, 377 §
Edgar, James Huston, Obituary, 95, 484
Ehmer, W.— Um den Gipfel der Welt: die Geschichte des Bergsteigers Mallory, 282 §
Ekman, quoted on winds and currents, 44
Ellis, A. F., Ocean Island and Nauru, 181 §
England, R., Colonization of Western Canada, 274 §

England all the Way: J. Turle, 168 §; Historical Geography of England before A.D. 1800: *ed.* H. C. Darby, 375 §; River Navigation in E—, 1600–1750: T. S. Willan, 281 §; Scot over Border: I. F. Anderson, 168 §
——— and Wales, Atlas of, Maps of C. Saxton, 1574–9. Introdn. by E. Lynam, 556 §
Epstein, M., *ed.* Statesman's Year-Book, 1936, 378 §
Erskine, S., Palestine of Arabs, 76 §
Eskimo, Southampton Id., 233 *et seq.*; *see* Canadian
Espiritu Santo, Living in: T. H. Harrisson, 243 *
Ethiopia, Measuring, and Flight into Arabia: C. S. Coon, 272 §
Etna, Mt., Earthquakes of, G. Imbò, 94 §
Europe— Geologie von Europa: S. von Bubnoff, 75 §; Grand Tour: *ed.* R. S. Lambert, 168 §; Outline of European Economic Development: R. H. Soltau, 75 §
Everest, Mount, E— the Challenge: Sir F. Younghusband, 186 §; Mt. E— Expedition of 1936: H. Ruttledge, 190, 486, 491 *; personnel, 492–3; Photographic Surveys in Mt. E— Region: M. Spender, 289 *; Pilots' Book of Everest: Marquess of Douglas and Clydesdale and D. F. M'Intyre, 473 §; Um den Gipfel der Welt [Mallory]: W. Ehmer, 282 §
Exploring, Business of: R. C. Andrews, 188 §

F

FALKNER, T., Description of Patagonia and parts of S. America, 81 §
Fantoli, R., on Drought in Libya, 94 §
Fawcett, Colonel, Fate of, 66 *
Fenner, C., on Australian Tektites, 287 §
Fezzan— Oasi del Fezzàn: E. Scarin, 175 §
Filchner, W., Journey in Northern Tibet, 382 §
Finland: New Nation: A. Rothery, 462 §
Finsterwalder, R., Alpenvereinskartographie, usw., 277 §
FitzRoy, quoted, on Peruvian Coastal Circulation, 52
Fleming, P., Journey through Central Asia, 128 *; News from Tartary, 558 §; quoted on fate of Colonel Fawcett, 66
———, W. L. S., quoted on geology and glaciology of Graham Land, 166
Flying Adventures: W. Mittelholzer, 189 §
Fontoura da Costa, A., As Portas da India em 1484, 378 §
Foster, H. A., Making of Modern Iraq, 463 §
Fourteenth of July Glacier, *see* Spitsbergen
Freeman, J. H., quoted on earthquake-resisting structures, 426
Frezier, —, quoted on currents off Peru, 41, 42
Fry, G. C., Textbook of Geography, 8th Edn., 89 §
Fuad, H.H. King, death, 482
Fulgurites in North and South Carolina, J. J. Petty on, 286 §

G

GAUA natives, Banks Ids., 337
Gaurier, Abbé L., Lacs des Pyrénées Françaises, 169 §
Gautier, E. F., L'Afrique Noire Occidentale, 178 §; Sahara, 175 §
Geddes, A., Population Maps of Bengal, 96 (*title only*)
Geographical Journal, Index to Supplements, 288, 573
Geography: Introdn. to Human Ecology: C. L. White and G. T. Renner, 565 §; Textbook of G—: G. C. Fry, 8th Ed., 89 §
Geoid and its Indirect Effect on Gravity, Tables for determining form of: W. D. Lambert and F. W. Darling, 86 §
George V., H.M. King, death, 481
Georgia, Spanish Missions of: J. T. Lanning, 179 §
Germany, Soil map, H. Stremme on, 573 §
Gerth, H., Geologie Südamerikas, 470 §
Gessner, F., *see* Correns, C. W.
Ghersi, E., *see* Tucci, G.
Ghorbal, Mrs. G., *see* Crump, W. B.
Giblin, R. W., death, 484
Gilbert, G. K., quoted on stream gradients, 436, 437, 446
Gillman, C., on place-name problem in Tanganyika, 230; Population Map of Tanganyika Territory, 466 §
Glen, A. R., work in North-East Land, 486
Goodenough, Sir W., remarks on "Quetta Earthquake," 429
Gorer, G., Bali and Angkor, 559 §
Gorrie, R. M., Use and Misuse of Land, 875
Gover, J. E. B., A. Mawer and F. M. Stenton, Place Names of Warwickshire, 554 §
Goyaz: H. Kruse, 181 §
Graham Land Expedition, British, 165 *
Grant, Capt., quoted on Mkenke river problem, 230
Graves, C., Trip-tyque, 168 §
Gravity, *see* Geoid; Great Britain
Great Britain, Gravity Measurements in: E. C. Bullard and H. L. P. Jolly, 370 §; Nation's Water Supply: R. C. S. Walters, 566 §; The Land: now and to-morrow: R. G. Stapledon, 281 §
Greely, Maj.-Gen. A. W., death, 482–3
Greenland— G— Expedition, Oxford University 1935: H. O'B. Hayward, 148 *; personnel, 148; Vi Flyver over Isbjørnens Land: L. Koch, 370 §; *see* Rasmussen Land

Grimshaw, B., quoted on Malekula, 98
Guiana, British, new fall in, 262
Guiley, P. W., quoted on fate of Colonel Fawcett, 68–9, 71
Gunther, E. R., Variations in Behaviour of Peru Coastal Current—with an hist. introd., 37 *
Guthmann, A., remarks on "Living with People of Malekula," 124

H

Haddon, A. C., Reports, Cambridge Anthropol. Expedn. to Torres Straits, Vol. I. General Ethnography, 82 §
Hadhramaut: A Journey to the Sei'ar Country and through the Wadi Maseila: W. H. Ingrams, 524 *; Southern Gates of Arabia: F. Stark, 459 §; Wadi H—, 541–2
Hajr, Wadi, Hadhramaut, 543
Hakluyt, The Two Richard Hakluyts: Original Writings and Correspondence of: *ed.* E. G. R. Taylor, 379 §
Hanke, M., and H. Degner, on Cartography of Prussia, 574 §
Harrison, J. V., Kuhgalu: South-West Iran, 20 *
Harrisson, T. H., Cuthbert Peek Grant to, 92, 579–80; Living in Espiritu Santo, 243 *; Living with People of Malekula, 97 *; New Hebrides People and Culture, 332 *; quoted on Atchin Id. culture, 346 *et seq.*; work in New Hebrides, 485
Hasluck, M., Archaeological History of Lake Ostrovo in West Macedonia, 448 *
Hawaii: Pageant of Soil: J. Hobbs, 84 §
Hayward, H. O'B., Oxford Univ. Greenland Expedn., 1935, 148 *
Hedin, S., Hyllningsskrift tillägnad Sven Hedin, 283 §
Herald Id. Currents, Russian Arctic, 164
Hermann, A., Historical and Commercial Atlas of China, 271 §
Heusinger, E. W., Early Explorations, etc., in Texas, 564 §
Hill, Sir L., quoted on acclimatization at high altitudes, 492, 513
Himalaya, Assam, 385–7
Hinks, A. R., remarks on "Photographic Surveys in Mount Everest Region," 302
'Hints to Travellers,' new edition, 490
Hobbs, J., Hawaii Pageant of Soil, 84 §
———, W. H., quoted on mud volcanoes, 424
Hogarth, D. G., quoted on Hadhramaut, 524
Hoover, M. B., *see* Rensch, H. E. and E. G.
Hornafjördur storm beaches, Iceland, 443–6
Hotine, Major M., East African Arc, 471 §
Hubbard, B. R., Cradle of Storms, 365 §
Hubert, H., Greatness and Decline of Celts, 571 §
Huddersfield Woollen Industry, W. B. Crump and Mrs. G. Ghorbal on, 381 §
Hughes, G. M., Roman Roads in South-East Britain, 379 §
Human Geography— Lições de Geografia Humana: A. de Amorim Girão, 184 §
Humboldt Current, name, 47, 60
Humboldt, quoted on climate of Peru, 42–3
Humphreys, G. N., Mt. Everest Expedn. Appendix VI: Health, 511; Appendix IX: Collecting, 518; remarks on "Mt. Everest Expedn. of 1936," 521; work in Ellesmere Land, 484
Huxley, J. S., remarks on "Third Commission of R.R.S. *Discovery II*," 321
———, T. H., Diary of Voyage of H.M.S. *Rattlesnake*: *ed.* J. Huxley, 90 §

I

Ice-Cap on West Greenland Coast, 149
Iceland, Nivation, River Grading and Shoreline Development in South-East Iceland: W. V. Lewis, 431 *
Ikissima, J., quoted on fate of Colonel Fawcett, 71
Imbò, G., on Earthquakes of Mt. Etna, 94 §
Indian Monsoon in 1935, 298–9
Ingrams, W. H., Hadhramaut: Journey to Sei'ar Country and through Wadi Maseila, 524 *; quoted on map of Hadhramaut, 551
Iran— Kuhgalu: South West I—: J. V. Harrison, 20 *
Iranian Minister, remarks on "Persia in 1935," 226
Iran Society, 227
Iraq, Making of Modern: H. A. Foster, 463 §
Ireland, Prehistoric Man in: C. P. Martin, 74 §
Isfahan, Persia, 219

J

Jamaica, *see* Morgan, Sir H.
Japan, Problem of: Capt. M. D. Kennedy, 77 §
Jensen, A. E., and others, Im Land des Gada, 562 §
Jessen, O., Reisen und Forschungen in Angola, 362 §
Jolly, E. C., *see* Bullard, E. C.

K

Kalfafellsdalur river gradient, Iceland, 435

Kangerdlugssuak fjord, 194
Kanter, H., Der Gran Chaco, 80 §
Karakoram— Dämon Himalaya: G. O. Dyhrenfurth and others, 358§; Society's map of, 490; Unknown K—: R. C. F. Schomberg, 560 §
Kashgar, 142
Kathiri Sultanate, Aden Protectorate, 524–8
Kazan river, N.W. Territories, 8–10
Keeling, E. H., member of Council, 581
Keewatin District, reindeer survey, 6–7
Kelly, S. A., *see* Abercrombie, P.
Kemp, S., remarks on "Third Commission of R.R.S. *Discovery II*," 318; remarks on "Variations in Behaviour of Peru Coastal Current," 62; speech at Annual Dinner, 589; Victoria Medal to, 92, 578
Kennedy, Capt. M. D., Problem of Japan, 77 §
Kennett, D. K., Dance of Bassas at Abaji, 456 *
Kenney, H. T., In Lightest Africa, 467 §
Kenya, Stone Age Races: L. S. B. Leakey, 173 §
Khotan, Sinkiang, 141
King, Col., on Rio Plomo Ice-dam, 286
Kittigazuit Reindeer Grazing Preserve, 16–17
Knowles, L. C. A., and C. M. Knowles, Economic Development of British Overseas Empire, 360 §
Koch, L., Vi Flyver over Isbjørnens Land, 370 §
Koko Nor, 135
Kondoa District, Tanganyika— Alleged Place-name Problem in Tanganyika, 230
Köppen, W., on Variations of Level of Caspian Sea, 476 §
Kozlov, Col. P. M., death of, 483
Krije, E. J., Social System of Zulus, 178 §
Kruse, H., Goyaz, 181 §
Kuhgalu: South-West Iran: J. V. Harrison, 20 *
Kuh-i-Alvarz, Mt., Persia, 30–31
Kuh-i-Dina, Mts., Persia, 20, 22, 34, 35
Kuh-i-Khami, Mt., Persia, 30, 32
Kuh-i-Nir, Mts., Persia, 28
Kumbum Monastery, Tibet, 133

L

LAMBERT, R. S., *ed.* Grand Tour, 168 §
———, W. D., and F. W. Darling, Tables determining Form of Geoid and its Indirect Effect on Gravity, 86 §
Lancaster, Chancellor of Duchy of, *see* Davidson, Sir J.
Lanchow, Kansu, 132–3
Land— Use and Misuse of L—: R. M. Gorrie, 87 § ; *see* Great Britain
Langford, Prof. D. B., quoted on earthquake experiences, 415
Lanning, J. T., Spanish Missions of Georgia, 179 §
Larsen, H., remarks on "Journey in Rasmussen Land," 209
Laus tribe, New Hebrides, 98
Layard, J. W., Atchin Twenty Years Ago, 342 *; quoted on New Hebrides, 332, 339; remarks on "Living with People of Malekula," 125
Leachman, Col. G. E., Paladin of Arabia: Biography: Maj. N. N. E. Bray, 268 §
Leahy, M., Murchison Grant to, 92, 579
Leakey, L. S. B., Stone Age Races of Kenya, 173 §
Lebombo hills, Swaziland, 322 *et seq.*
Leimbach, W., Landeskunde von Tuwa, 267 §
Levick, Comm. M., and Public Schools Exploring Soc., 488
Lewis, W. V., Nivation, River Grading and Shoreline Development in South-East Iceland, 431 *
Libya, Drought in, R. Fantoli on, 94 §
Lin Yutang— My Country and My People, 171 §
Llanberis, *see* Snowdon
London, Population of Greater, [Map]: A. C. O'Dell, 353 §
Longstaff, T. G., remarks on "Oxford Univ. Greenland Expedn., 1935," 160
Low Isles, Cyclone at, Mr. Moorhouse on, 383
Lubbock, B., *see* Spurling, J.
Lucas, E. V., Highways and Byways in Sussex, 267 §
Lynam, E., *see* Saxton, C.
Lyne, R. N., Apostle of Empire: Life of Sir Lloyd William Mathews, 375 §

M

M'INTYRE, D. F., *see* Douglas and Clydesdale, Marquess of
McIntyre, J. C., on fate of Col. Fawcett, 71
McKay, R. C., South Street, 181 §
Mackenzie District, reindeer survey, 5–6
Mackintosh, N. A., Third Commission of R.R.S. *Discovery II*, 304 *
Macleod, D. J., *see* Martin, M.
Madigan, C. T., Central Australia, 275 §
Magnaghi, A., Precursori di Colombo? 184 §
Maillart, E., remarks on "Journey through Central Asia," 144
Maki ritual, Malekula, 344–7, 348–9
Malaxbygden: H. Smeds, 171 §
Malekula, Living with People of: T. H. Harrisson, 97 *
Mallory, G. L., Um den Gipfel der Welt: [Biogr. of Mallory]: W. Ehmer, 282 §
Malo, New Hebrides, 258–9
Manahil tribe, Hadhramaut, 542
Manley, G., on Early MS. Map of County of Durham, 382 §

Manning, T. H., Some Notes on Southampton Island, 232 *; expedn. in Arctic Canada, 487–8
Maps, Key to: Brig. H. S. L. Winterbotham, 373 §
Marett, R. R., *see* Buxton, L. H. D.
Margary, I. D., Notes in "Roman Roads in South-East Britain": G. M. Hughes, 379 §
Marion Id., Southern Ocean, 312, 317
Martin, C. P., Prehistoric Man in Ireland, 74 §
———, Martin, Description of Western Islands of Scotland, *circa* 1695: incl. Descr. of Western Isles by Sir D. Monro, 73 §
Maseila, Wadi, *see* Hadhramaut
Mason, K., remarks on "Photographic Surveys in Mount Everest Region," 300
Mastung and Quetta earthquake, 414 *et seq.*
Mathews, Sir L. W., Apostle of Empire: R. N. Lyne, 375 §
Mathieson, Dr., quoted on snow houses, 234
Matthews, H. A., remarks on "Variations in Behaviour of Peru Coastal Current," 63
Maurer, H., quoted on Doubly-Equidistant Projection, 480
Mawer, A., *see* Gover, J. E. B.
Mazanderan Province, Persia, 217
M'babane, Swaziland, 330–1
Mbandine, Swazi chief, 325–6
Meshed, Persia, 223
Meshed, Hadhramaut, 533
Mill, H. R., remarks on "Third Commission of R.R.S. *Discovery II*," 319; on "Variations in Behaviour of Peru Coastal Current," 62
Miller, J., Camel-Bells of Baghdad, 172 §
Milne, G., Provisional Soil Map of East Africa, 465 §
Milthers, K., *see* Bornebusch, C. H.
Missionaries in New Hebrides, 335 *et seq.*
Mittelholzer, W., Flying Adventures, 189 §
Mkenke river problem, Tanganyika, 230
Monro, Sir D., *see* Martin, M.
Monsoon and Mt. Everest expedn., 1936, 494 *et seq.*
Moore, A. W., work in Ellesmere Land, 484
Moorhouse, —, on cyclone at Low Isles, 383
Morgan, Sir Henry, Life, with Account of English Settlement of Jamaica (1655–88): E. A. Cruikshank, 472 §
Morris, C. J., Mt. Everest Expdn. Appendix I: Selection and Training of Porters; II: Transport, 501; 502
Morrison, James, Journal of, Boatswain's Mate of *Bounty*: *ed.* O. Rutter, 380 §
Morshead, Major, *see* Bailey, Col. F. M.
Mott, P. G., remarks on "Oxford Univ. Greenland Expedn., 1935," 159
Mowazi, Swazi chief, 325
Moyne, Lord, new member of Council, 581
Mud volcanoes, 424
Muhammad Ayub Khan, Back Grant to, 92
Mukalla, Hadhramaut, 528
Munck, E., Rasmussen Land expedn., correction, 480
Murchie, R. W., W. Allen and J. F. Booth, Agricultural Progress on Prairie Frontier, 366 §
Murray, G. W., Founder's Medal to, 92, 577; speech at Annual Dinner, 587
Musk-ox in Canada, 2

N

Nahuel Huapí, Argentine National Park, 288
Naksh-i-Rostam rock reliefs, Persia, 220
Nambas tribes, Malekula, 103 *et seq.*
Nanda Devi: E. E. Shipton, 172 §; ascent, 487
Nauru, *see* Ocean Island
Nelson, Lt. A. L., Gill Memorial to, 92, 580
Neumann, A. E. S., *ed.* Falkner's Descripn. of Patagonia, etc., 81 §
Newfoundland, Public School Explorers in: D. Clarke, 79 §
New Hebrides People and Culture: T. H. Harrisson, 332 *
New York— South Street: R. C. McKay, 181 §
Niño, Counter-Current, 45–6, 51
Nivation, *see* Iceland
Nomo Khantara, Tibet, 136–7
North Sea, Southern, Regional Petrology of: J. A. Baak, 84 §
Norway, Wayfarer in: S. J. Beckett, 75 §
Novák, V. J., on Geomorphology of Czecho-slovakia, 286 §

O

Oakley, A., Heart of Provence, 463 §
Ocean Island and Nauru: A. F. Ellis, 181 §
Oceanography, Das Meer in Volkstüml. Darstellng. Bd. 3. Tiefseebuch: C. W. Correns and Others, 567 §
O'Dell, A. C., Population of Greater London, [Map], 353 §
Oldham, R. D., quoted on stream gradients, 436, 446
Odum, H. W., Southern Regions of United States, 366 §
Oestreich, K., quoted on Lake Ostrovo, 451, 455
Omar Khayyam, 223, 227
Omba, Mt., Espiritu Santo, 259
Onslow, Earl of, Speech at Annual Dinner, 589
Ordnance Survey, future policy, 489

Ostrovo, Lake, in West Macedonia, Archaeological Hist.: M. Hasluck, 448 *
Oxfordshire, Companion into: E. C. Williams, 74 §
Oxygen problem (Mt. Everest): G. B. Warren, 515–18 *

P

Palestine of Arabs: S. Erskine, 76 §
Papuan Epic: K. Bushell, 183 §
Patagonia, Description of, and parts of S. America: T. Falkner, 81 §
Pateli monastery, Lake Ostrovo, 448 *et seq.*
Persepolis, Persia, 220
Persia in 1935: Baroness Ravensdale, 216 *; *see* Iran
Peru Coastal Current, Variations in Behaviour, with hist. introd.: E. R. Gunther, 37 *
Peru Oceanic Current, 60
Pessione, V., quoted on fate of Colonel Fawcett, 67–8
Peter I. Island, Antarctic, 308–9
Petrullo, V., quoted on fate of Colonel Fawcett, 66 *et seq.*
Petty, J. J., on Fulgurites in North and South Carolina, 286 §
Philby, H. St.J. B., Journey in Arabia, 475, 488
Philippines— Odyssey of Islands: C. N. Taylor, 369 §; *see* South Sea Savages
Photogrammetry— Applicatn. de la Téléphotographie en Topographie d'explorn.: P. Choffat, 277 §; Einführung in die Luft- und Erdbildmessung: K. Schwidefsky, 568 §
Pigeot, Capt., on Course of Wadi Dra'a, 382 §
Pilbin, P., on Tyneside industries, 573
Plankton, Antarctic, 315, 319
Plender, Lord, Treasurer of R.G.S., 581
Plomo, Rio, Ice-dam, 286
Polish Ambassador, H.E., speech at Annual Dinner, 590
Poor White problem, Swaziland, 331
Porsild, E., Reindeer Industry and Canadian Eskimo, 1 *
Portuguese Voyages— As Portas da India em 1484: A. Fontoura da Costa, 378 §
Potosi, Lakes of, W. E. Rudolph on, 575 §
Po-Yigrong river, hydrology, eastern Himalaya, 395–400; range, 401, 409
Prairie Provinces— Agricultural Progress on Prairie Frontier: R. W. Murchie, W. Allen and J. F. Booth, 366 §
Price, M. F., America after Sixty Years, 274 §
Projection, Doubly-Equidistant, letter by Sir C. F. Close, 480
Provence, Heart of: A. Oakley, 463 §
Prussia, Cartography, M. Hanke and H. Degner on, 574 §
Pueblo Ruins, Dating of, by Annual Tree-rings, A. E. Douglass on, 93 §
Pygmy and Negro Hosts, My: P. Schebesta, 78 §
Pyrenees— Lacs des Pyrénées Françaises: Abbé L. Gaurier, 169 §

Q

Qu'aiti sultanate, Aden Protectorate, 524–8
Qubhudh, Wadi, Hadhramaut, 539
Quebec, Central, Geography, R. Blanchard on, 92; L'Est du Canada Français: R. Blanchard, 364 §
Quetta Earthquake: C. P. Skrine, 96 (*title only*), 414 *

R

Ramsbottom, J., remarks on "Botanical Explorns. in Tibet 1935," 411
Ranger river, Southampton Id., 238
Rannie, D., quoted on Sakau people, New Hebrides, 257
———, J. L., and W. M. Dennis, on Modifications to Wild Theodolites, 475 §
Rasmussen Land, Journey in: A. Courtauld, 193 *; *correction to*, 480
Rattin, S., quoted on fate of Colonel Fawcett, 66
Ravensdale, Baroness, Persia in 1935, 216 *
Rawlinson, Canon, quoted, on Nakh-i-Rostam rock reliefs, 220
Reindeer Industry and Canadian Eskimo: E. Porsild, 1 *
Renooij, D. C., *see* Verwey, G.
Rensch, H. E. and E. G., and M. B. Hoover, Historic Spots in California: Valley and Sierra Counties, 468 §
Rice, N. R., on place-name problem in Tanganyika, 230
Richmond, I. A., *see* Ashby, T.
Rickards, Fl.-Lt., map of Hadhramaut, 548, 551
Rigby, General, Zanzibar and Slave Trade: *ed.* Mrs. C. E. B. Russell, 359 §
Riley, quoted, on meteorology of Graham Land, 166
Rivers, W. H., quoted on New Hebrides, 335, 341
Roberts, B., quoted on birds of Graham Land, 167
Robinson, G. W., Soils: Their Origin, Constitution and Classification, 372 §
Roch, T., quoted on fate of Colonel Fawcett, 69–70
Roman Roads in South-East Britain: G. M. Hughes, 379 §
Rome, Aqueducts of Ancient: T. Ashby, 552 §

Ross, Sir D., remarks on "Persia in 1935," 227
——, Sir J. C., magnetic charts of Antarctic, 320
Rothery, A., Finland: New Nation, 462 §
R.G.S.— Address at Annual General Meeting: Maj.-Gen. Sir P. Cox, 451; Annual Dinner, 582–91; Annual Report, 580–1; Index to Supplements, 288, 573; Medals and Awards, 92, 576–80; Meetings and Elections, 96, 567, 591
Rudolph, W. E., on Lakes of Potosi, 575 §
Russell, Mrs. C. E. B., General Rigby, Zanzibar and Slave Trade, 359 §
Russia, *see* U.S.S.R.
Russian Arctic research, 163–4
Rutter, O., *ed.*, Journal of J. Morrison, Boatswain's Mate of *Bounty*, 380 §
Ruttledge, H., Mt. Everest Expedn. of 1936, 190, 491 •
Ryder, Lt., quoted on hydrography of Graham Land, 167

S

Sahara: E. F. Gautier, 175 §
——, French, In Lightest Africa: H. T. Kenney, 467 §
Sail: Romance of Clipper Ships. Vol. III: J. Spurling and B. Lubbock, 380 §
St. Kilda, *see* Scotland
Sakau, New Hebrides, 257
Salih, Prophet, tomb, Hadhramaut, 535
Sandford, K. S., remarks on "Oxford Univ. Greenland Expedn., 1935," 160
Sapper, K., Geomorphologie der Feuchten Tropen, 163 §
Sarfartok river, West Greenland, 149–51
Sar region, Himalaya, 290–1
Saxton, C., Atlas of England and Wales. Maps of C. S., 1574–9. Introdn. by E. Lynam, 556 §
Scarin, F., Oasi del Fezzàn, 175 §
Schebesta, P., My Pygmy and Negro Hosts, 78 §
Schmidt, E., quoted on Persian archaeology, 218
Schomberg, R. C. F., Unknown Karakoram, 560
Schott, quoted on sea temperature of Peru, 56
Schubert, O. v., *see* Correns, C. W.
Schuchert, C., Historical Geology of Antillean–Caribbean Region, 368 §
Schwidefsky, K., Einführung in die Luft- und Erdbildmessung, 568 §
Scotland, Description of Western Islands of, *circa* 1695, by Martin Martin: including Voyage to St. Kilda by same author and Description by Sir D. Monro. *Ed.* D. J. Macleod, 73 §
Scott, J. M., member of Council, 581
Sea-ice, formation of, 308–9
Sei'ar Country, *see* Hadhramaut
Seiyids of Hadhramaut, 525–6
Seligman, G., Chairman of British group on Internat. Snow Commission, 93; Snow Structure and Ski Fields, 372 §
Semang River in British Guiana, New Fall on, 262
Sen, —, quoted, on Indian Monsoon in 1935, 298–9
Seward, Prof., remarks on "Reindeer Industry and Canadian Eskimo," 17
Shackleton, E., work in Ellesmere Land, 484
Sharpe, Sir A., death, 483
Shaw, H., on Tyneside Geographical Society, 573
——, W. B. K., work in Libyan Desert, 485
Shibam, Hadhramaut, 533–5
Shihr, Hadhramaut, 551
Shillong Plateau— Plateau de Meghalaya (Garo-Khasi-Jaintia): S. P. Chatterjee, 358 §
Shipton, E. E., Nanda Devi, 172 §; work in Mt. Everest region, 289, 292, 295, 486
Shiraz, Persia, 220
Shulistan plain, Persia, 31–2
Sian, China, 130
Sining, Chingai, 133
Sinkiang, political, 128
Sisakt plain, Persia, 35
Sixteen Mile Brook, Southampton Id., 238
Ski Fields, *see* Snow Structure
Skrine, C. P., Quetta Earthquake, 96 (*title only*), 414 •
Slave Trade, *see* Rigby
Smeds, H., Malaxbygden, 171 §
Smythe, F. S., Mt. Everest Expedn. Appendix IV: Photography, 506; V, Snow Conditions on North Col, 508; remarks on "Mt. Everest Expedn. of 1936," 520, 521
Snow, Internat. Commission of, 93; S— Structure and Ski Fields: G. Seligman, 372 §
Snowdon, Guide to, and Llanberis: V. Davis, 462 §
Sodaf, Wadi, Hadhramaut, 536–7
Soils: origin, constitution and classification: G. W. Robinson, 372 §
Sölch, J., Fluss und Eiswerk in der Alpen zw. Ötztal u. St. Gotthard, 263 §
Soltau, R. H., Outline of European Economic Development, 75 §
Søndre Strømfjord, West Greenland, 148–9
Soper, J. D., on Journey in Southern Baffin Land, 384 §
Southampton Island, Some Notes on: T. H. Manning, 232 •
Southern Ocean depths, 317
South Downs, Geomorphology of, A. J. Bull on, 476 §
—— Georgia, 305, 319
—— Sandwich Deep, Southern Ocean, 317

South Sea Savages, Wanderings among, and in Borneo and the Philippines: H. W. Walker, 182 §
—— Shetland Ids., 310–11
Spain— Trip-tyque: C. Graves, 168 §
Speiser, F., quoted on Malekula, 97; quoted on New Hebrides, 333, 341
Spender, M., Photographic Surveys in Mount Everest Region, 289 •; remarks on "Journey in Rasmussen Land," 213
Spitsbergen— Scientific Results Norwegian-Swedish Expedn. 1934: H. W. Ahlmann. Part V. Fourteenth of July Glacier, 275 §
Spurling, J., and B. Lubbock, Sail: Romance of Clipper Ships, Vol. III, 380 §
Stahlberg, W., *see* Correns, C. W.
Stamp, L. D., member of Council, 581; Asia: Regional and Economic Geography, 572 §
Stane Street, With a Spade on: S. E. Winbolt, 554 §
Stapledon, R. G., The Land: now and to-morrow, 281 §
Stark, F., Southern Gates of Arabia: Journey in Hadhramaut, 459 §; quoted on Dammun, Hadhramaut, 541; work in Hadhramaut, 484
Statesman's Year-Book, 1936: *ed.* M. Epstein, 378 §
Steele, Major H., Policing the Arctic, 276 §
Stefansson, V., quoted on snow-houses, 234
Stein, Sir A., work in Persia, 487
Stenton, F. M., *see* Gover, J. E. B.
Stephenson, quoted on meteorology of Graham Land, 166
Stremme, H., on Soil Map of Germany, 573 §
Subansiri river, Assam, sources of, 387
Sudan, Gari Gari: H. A. Bernatzik, 561 §
Suffolk, East, Regional Planning Scheme: P. Abercrombie and S. A. Kelly, 352 §
Sugar Loaf Mt., Baker Lake, N.W.T., 9–10
Surveyors, Proceedings, Fifth Congress of Internat. Federation, 1934: *ed.* M. C. Clay, 89 §
Sussex— County of S—: H. Belloc, 352 §; Highways and Byways in S—: E. V. Lucas, 267 §
Sut Burun fortress, Lake Ostrovo, 453
Sutherland, W., Alexandrine Tinne, 88 §
Sverdrup, quoted, on upwelling in Peru Coastal Current, 45
Swaziland, Economic Geogr. of: D. M. Doveton, 322 •
Sykes, Sir P., remarks on "Persia in 1935," 228
Sylvester, D., on Northumbria, 573

T

Tahiti, Journal of J. Morrison: *ed.* O. Rutter, 380 §
Tamimi tribe, Hadhramaut, 542–3
Tana, Lake, and Blue Nile: Maj. R. E. Cheesman, 272 §
Tanganyika, Alleged Place-name problems in, 230; Population Map: C. Gillman, 466 §
Tarim, Hadhramaut, 541
Tartary, News from: P. Fleming, 558 §
Taylor, C. N., Odyssey of Islands, 369 §
———, E. G. R., *ed.* Original Writings and Correspondence of two Richard Hakluyts, 379 §
Tehran, Persia, 218
Teichman, Sir E., remarks on "Journey through Central Asia," 146
Tektites, Australian, C. Fenner on, 287 §
Telescopes, Disposal of, 288
Tessan, de, quoted on Peru Coastal Current, 43–4
Texas, Early Explorations, etc.: E. W. Heusinger, 564 §
Thalbitzer, Prof., quoted on Eskimo names, 241–2
Theodolites, *see* Wild
Thompson, —, remarks on "Photographic Surveys in Mt. Everest Region," 301
Tibesti, Mission au (1930–31): M. Dalloni, Tome II, 177 §
Tibet, Botanical and Geographical Explorations in, 1935: F. K. Ward, 385 •; summary of results, 406–10; Dr. Filchner's Journey in Northern, 382; flora, 519; Secrets of T—: G. Tucci and E. Ghersi, 76 §
Tidal stresses and earthquakes, 425
Tinne, Alexandrine: W. Sutherland, 88 §
Tobacco growing, Swaziland, 329
Torres Straits, Reports, Cambridge Anthropol. Expedns. to. Vol. I, General Ethnography: A. C. Haddon, 82 §
Trimborn, H., Fuentes, Historia Cultural de la América Precolombina, 469 §
Tristan da Cunha, 305
Tropics— Geomorphologie der Feuchten Tropen: K. Sapper, 183 §
Trucchi, M., quoted on fate of Colonel Fawcett, 71
Tsaidam area, Central Asia, 134
Tsangpo, former course of, 392–3
Tsari Valley, Upper Assam, rainfall, 390
Tsoga sacred lake, Tibet, 390–1
Tucci, G., and E. Ghersi, Secrets of Tibet, 76 §
Tungans, 129, 137, 141
Tungkussu monastery, Tibet, 134
Turley, C., Roald Amundsen, Explorer, 88 §
Tuwa, Landeskunde von: W. Leimbach, 267 §
Tyneside Geographical Society, *Journal* of, 573 §
Tyrrell, J. W., quoted on Yathkyed Lake, 9–11

U

ULLOA, quoted, on climate of Peru, 41
Ulyatt, P. and G., quoted on fate of Colonel Fawcett, 72
United States— America after Sixty Years: M. P. Price, 274 §; Southern Regions: H. W. Odum, 366 §
U.S.S.R., Internal Development of, 162

V

VANIER, Col., remarks on "Reindeer Industry and Canadian Eskimo," 18
Vao Id., Malekula, social organization, 343
Verwey, G., and D. C. Renooij, Economist's Handbook, 377 §
Vivaldi brothers— Precursori di Colombo? A. Magnaghi, 184 §
Voyage— Horizon's Rim: A. C. Brown, 187 §

W

WAGER, L., work in East Greenland, 485
Wala Id., Malekula, language, 342
Wales, *see* England and Wales
Walker, H. W., Wanderings among South Sea Savages, etc., 182 §
Walter, R., quoted on South American Climate, 40–1
Walters, R. C. S., Nation's Water Supply, 566 §
Ward, F. Kingdon, Botanical and Geographical Explorations in Tibet, 1935, 385 *; summary of results, 406–10, 487
Warren, C. B., Mt. Everest Expedn. Appendix VII: Physiology, 512; VIII, Oxygen Problem, 515; remarks on "Mt. Everest Expedn. of 1936," 521
Warwickshire, Place Names of: J. E. B. Gover, A. Mawer, and F. M. Stenton, 554 §
Water Supply, *see* Great Britain
Watiamason, Mt., Espiritu Santo, 256
Watkins Mts., height, 206
Wattenberg, H., *see* Correns, C. W.
Wegener, G., Chinesische Reich, 357 §
Wellcome, Sir Henry, Obituary, 483, 576
West, W. D., quoted on seismology of Quetta earthquake, 420 *et seq.*
Whales and environment, 313
Whaling industry, Antarctic, 320, 321
Wheeler, Col., quoted on surveys in Mt. Everest region, 292, 300
White, C. L., and G. T. Renner, Geography, 565 §
Whitlock, Col. G. F. A., Obituary by C. F. C., 479
Wieder, F. C., on "Far East," 191
Wild Photo-theodolite, 296–7; W— Theodolites, Modifications to, J. L. Rannie and W. M. Dennis on, 475 §
Willan, T. S., River Navigation in England, 1600–1750, 281 §
Willcocks, Sir W., Sixty Years in East, 185 §
Williams, E. C., Companion into Oxfordshire, 74 §
Wilson, Rt. Rev. C., quoted on Banks Ids., 337, 341; quoted on New Hebrides, 243
Winbolt, S. E., With a Spade on Stane Street, 554 §
Windham, W. R. Smijth, Mt. Everest Expedn. Appendix III: Wireless, 503
Winkel, O., quoted on Doubly-Equidistant Projection, 480
Winterbotham, H. S. L., Key to Maps, 373 §
Winthuis, J., Mythos und Kult der Steinzeit, 91 §
Winton Jones, A. de, quoted on fate of Colonel Fawcett, 71
Wissman, H. von, Map of Hadhramaut, 551
Witte, quoted on Peru Coastal Current, 44
Wordie, J. M., remarks on "Journey in Rasmussen Land," 214
Wüst, quoted on Peru Coastal Current, 47;
Wüst, G., *see* Correns, C. W.
Wyndham, R., Gentle Savage, 273 §

Y

YARU CHU lake bed, Himalaya, 293–4
Yathkyed Lake, N.W.T., 7–11
Yenisei Basin, Upper— Landeskunde von Tuwa: W. Leimbach, 267 §
Young, A. E., quoted on Doubly-Equidistant Projection, 480
Younghusband, Sir F., Everest: the Challenge, 186 §
Yugoslavia, Wanderings in: N. Alexander, 266 §

Z

ZANZIBAR, *see* Rigby, Gen.
Zarate, A. de, quoted on Peru Coastal Current, 38
Zulus, Social System: E. J. Krije, 178 §

INDEX TO MAPS

EUROPE

Iceland, sketch-maps of parts of S.E., 432, 444
Ostrovo, Lake, W. Macedonia, 450

ASIA

Aden Protectorate, sketch-map, 525; Route traverse through Hadhramaut by W. H. Ingrams, 592
Central Asia, sketch-map to illustrate Mr. Fleming's journey, 134
Everest, Mt., Northern Face, based on Photographic Surveys by Michael Spender, 384
Kuhgalu, S.W. Iran, sketch-map, 23
Persia— in 1935, 221; Quetta Earthquake, sketch-map, 421
Tibet, Botanical and Geographical Explorations in Tibet 1935 by F. K. Ward, 480; Sketch-map of vegetation, 388

AFRICA

Kondoa District, Tanganyika, sketch-map, 231
Swaziland, sketch-maps, 322, 327

NORTH AMERICA

Arctic North America, sketch-map, 7
Southampton Island, sketch-map, 237; folding map, 288

SOUTH AMERICA

Matto Grosso, sketch-map, 67

ARCTIC

Greenland— Knud Rasmussen Land, 196; Greenland, West— sketch-map to illustrate O.U.Greenland E., 1935, 150; Sarfartok River District, 148

ANTARCTIC

Antarctic, sketch-map, showing route of *Discovery II*, 306
British Graham Land Expedition, sketch-map, 165
South Sandwich Deep, 316
South Shetland Ids., 310

PACIFIC

Espiritu Santo, New Hebrides, sketch-map, 245; Malekula Id., New Hebrides, 338; M—, Northern Part, sketch-map, 104; M—, sketch-map, 99; New Hebrides, sketch-map, 334

ILLUSTRATIONS AND DIAGRAMS

EUROPE

Iceland, S.E., nivation, etc., 431, 432–3, 434–6–7, 441

ASIA

Central Asia, 130–1, 138–9, 142–3
Everest, Mt., Expedition of 1936, 492–3, 494–5, 496–7, 498–9, 500–1, 508–9; Region, Photographic Surveys, 290–1, 294–5, 298–9
Hadhramaut, 532–3, 542–3, 548–9
Kuhgalu, S.W. Iran, 20–1, 28–9, 32–3
Persia, 218–9, 222–3, 224–5
Quetta earthquake, 416–7, 422–3
Tibet, 390–1, 394–5, 400–1

AFRICA

Abaji, N. Nigeria, 458–9
Swaziland, 304–5, 308–9, 314, 320–1

NORTH AMERICA

Arctic N. America, Reindeer Industry, 16–7
Southampton Id., 234–5, 240–1

SOUTH AMERICA

Semang River, British Guiana, fall, 262–3

ARCTIC

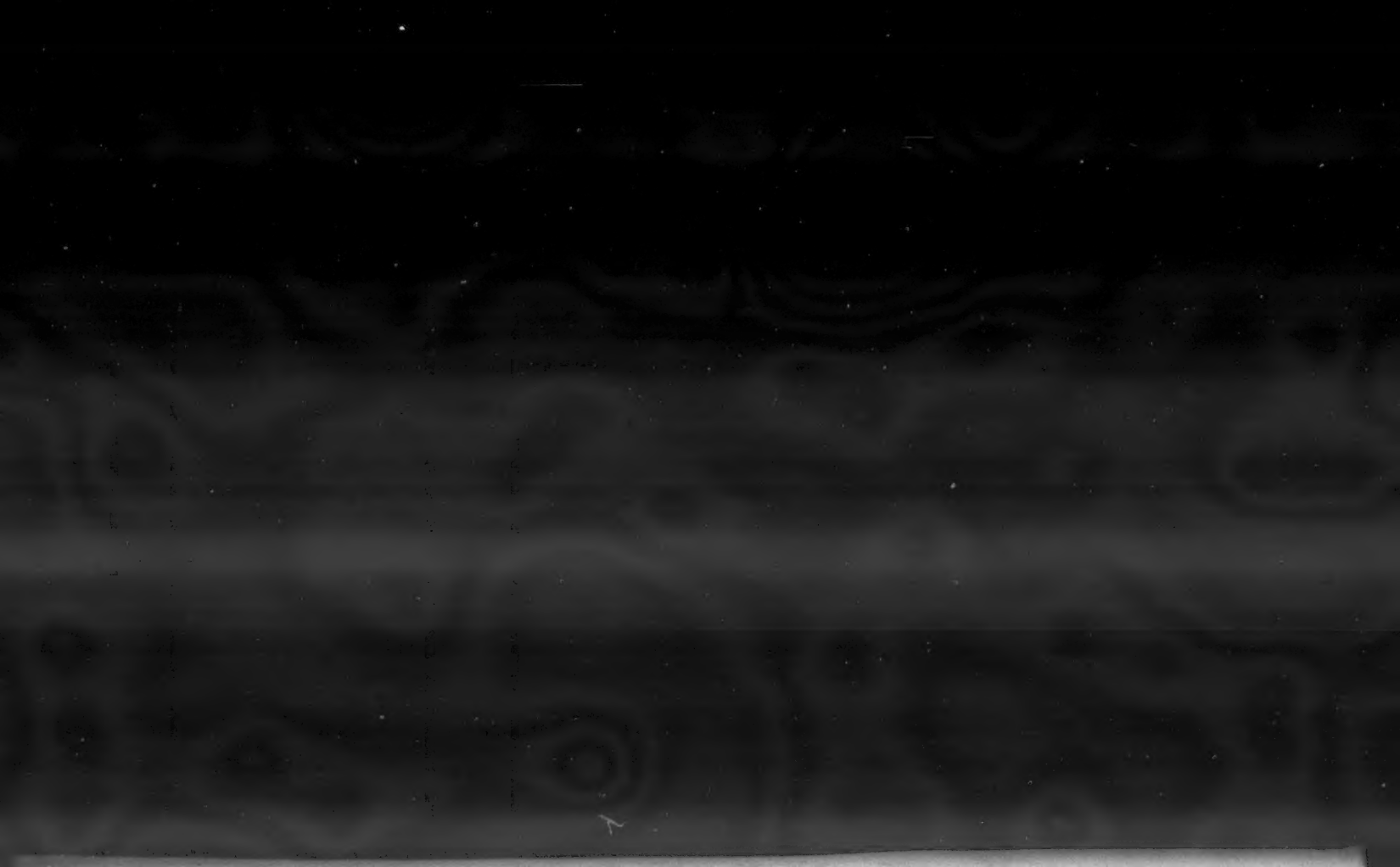
Greenland Expedition, Oxford University, 156–7
Rasmussen Land, Greenland, 198–9, 202–3, 204–5

ANTARCTIC

Discovery II, Third Commission of, 304–5, 308–9, 314, 320–1

PACIFIC

Espiritu Santo, 258–9; Malekula, 100–1, 108–9; New Hebrides, 332–3
Peru Current, 50–3–4–6–7–8

END OF VOL. LXXXVIII

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